

Air Force Logistics Management Agency



# 2002 Logistics Challenges

Issues and strategy  
for today's Air Force



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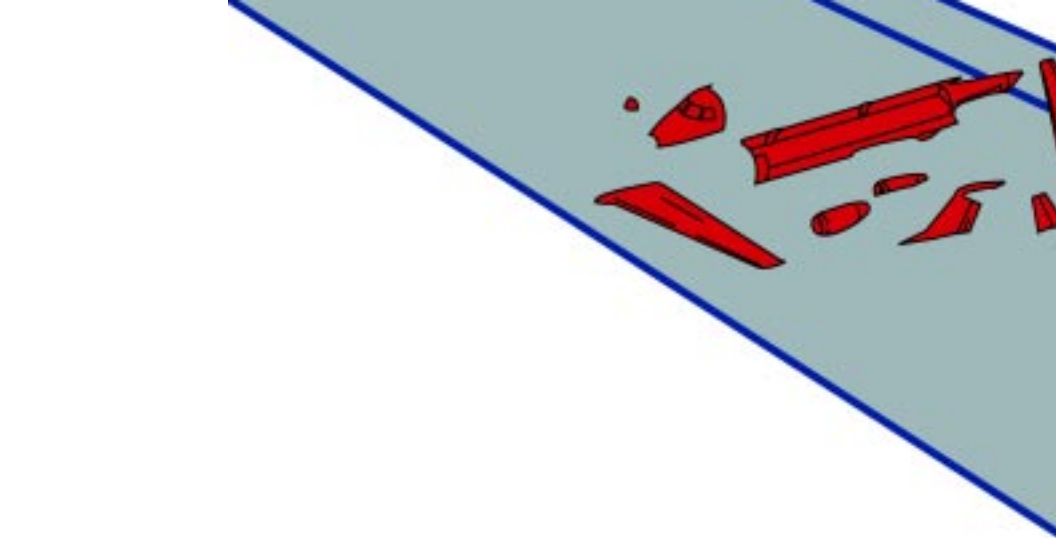
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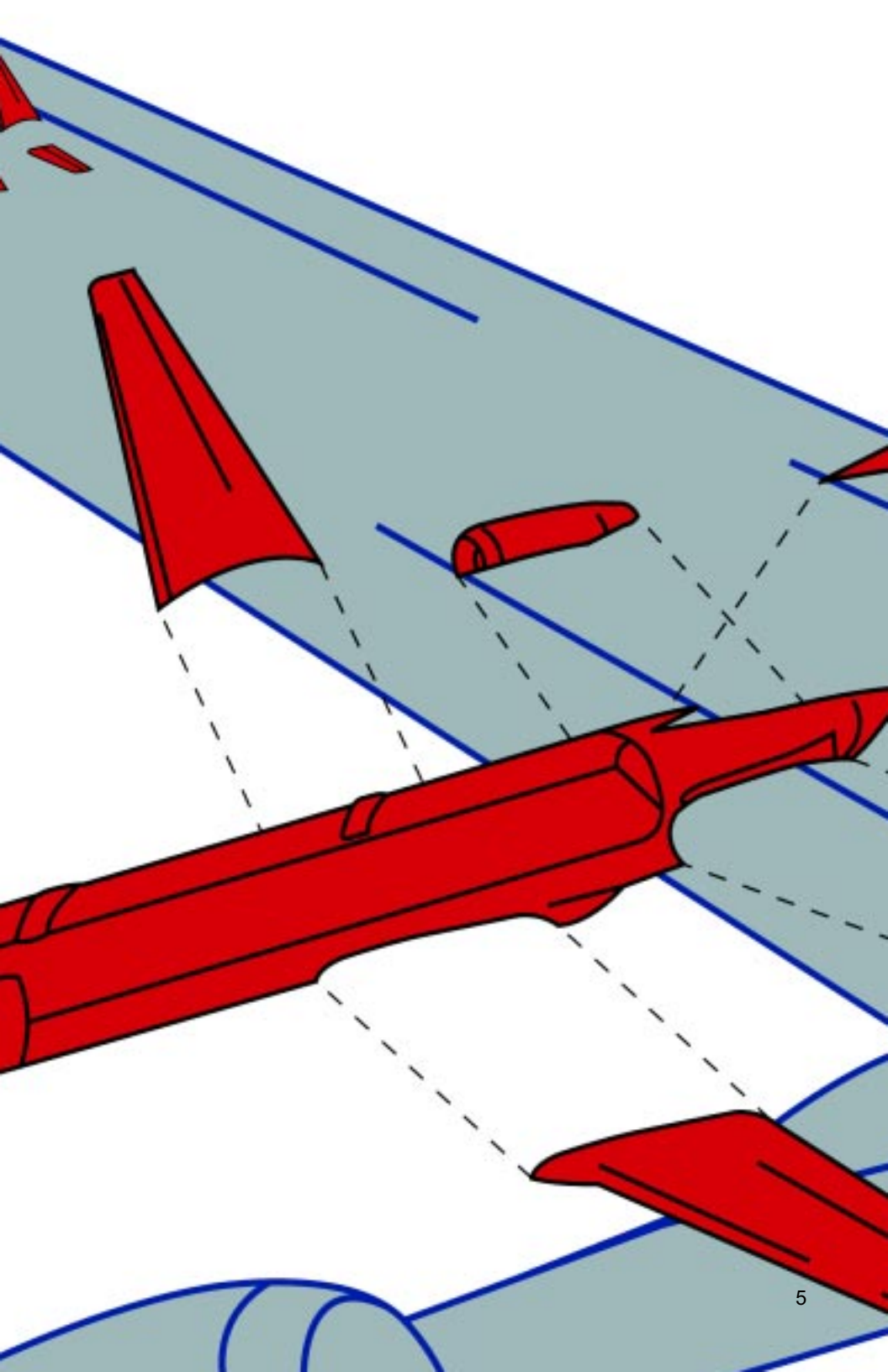
The US role in the post-Cold War world has changed dramatically. As a result, today's military faces many challenges, particularly in the area of logistics. Military forces are no longer dedicated solely to deterring aggression but must respond to and support a variety of combat and humanitarian missions. From

# Introduction

## Thinking about Logistics Challenges







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## Introduction

*Logistics Challenges is a collection of nine essays, articles, and studies that lets the reader look broadly at many of the logistics challenges associated with the expeditionary air force of the 21<sup>st</sup> century.*

peacekeeping, to feeding starving nations, to conducting counter-drug operations, the military must continue to adapt to evolving missions and working with a broad range of allies or coalition partners. Logistics infrastructure and processes must evolve to support the new spectrum of demands and challenges. New technological advances must be capitalized and integrated into the support infrastructure. Similarly, the logistics community must examine existing processes through a variety of studies and analyses efforts and look for ways to make quantitative and qualitative improvements. Accepted theories, practices, and processes need to be examined and, where necessary, challenged and changed. Two concepts dominate Air Force logistics today: Focused Logistics at the joint level and Agile Combat Support within the Air Force. The vision of both these concepts is the ability to fuse information, transportation, and other logistics technologies in order to provide rapid response, track and shift assets while en route, and deliver tailored logistics packages at all levels of operations or war. This same vision includes enhanced transportation, mobility, and pinpoint delivery systems.

Air Force logistics will also change as a result of the Chief's Logistics Review (CLR). At the heart of the CLR is changing Air Force logistics to meet the challenges of expeditionary airpower. Major CLR goals include:

- Keeping turbulence at a minimum by evaluating processes rather than organizations.
- Relating all changes/adjustments to the expeditionary aerospace force, specifically whether changes should be made for more centralized or decentralized support for home and deployed forces.
- Considering leadership development for officers—look at both logisticians and operators.

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- Developing changes or adjustments within constrained funding boundaries.

*Logistics Challenges* is a collection of nine essays, articles, and studies that lets the reader look broadly at many of the logistics challenges associated with the expeditionary air force of the 21<sup>st</sup> century. Included in the volume is the work of many authors with diverse interests and approaches. While small, it provides a broad cross section of the challenges. The content was selected for two basic reasons—to represent the diversity of the challenges faced and to stimulate thinking about these challenges. That's what we hope you do as you read the material . . . think about the challenges. Think about the lessons history offers. Think about why some things work and others do not. Think about problems. Think about organizations. Think about the nature of logistics. Think about fundamental or necessary logistics relationships. Think about the past, present, and future.

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# Mu





**Murphy wanted time to evaluate the possible replacements before selecting them. He insisted that departing incumbents remain in place until the very end of the month they were eligible to return from overseas.**

# **rmph's Law**

Colonel Murphy interviewed all senior noncommissioned officers and officers one-on-one within days of their arrival. This interview was strictly a one-way conversation.

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## **Colonel Logan "Jay" Bennett, USAF, Retired**

Colonel Crawford O. Murphy was my boss for 1 very remarkable year in the late 1970s. I was in a very comfortable assignment at the Military Personnel Center, Randolph AFB, Texas, but chose to go to Osan AB, Korea, for my second remote assignment in 15 years. About a month before departing, I received my first correspondence from the unit's deputy commander for maintenance (DCM), Colonel Murphy. It was a handwritten note stating, "Don't bring your golf clubs; we don't have time for it here." I'd heard all sorts of stories about this intrepid character (most recently from a friend, Major Luke Gill, who had arrived at Osan AB months earlier), so my anxiety was heightened with this caustic note. In the next 12 months, I was to receive many of these notes.

My assignment, on paper, was to command the component repair squadron (CRS). However, when I arrived, the departure of several field grade officers meant the maintenance control officer, CRS commander, aircraft generation squadron (AGS) commander, and quality control (QC) jobs were all up for grabs. Murphy wanted time to evaluate the possible replacements before selecting them. He insisted that departing incumbents remain in place until the very end of the month they were eligible to return from overseas. (All



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## Murphy's Law



*"Good morning, are you the commander of the Animal Gathering Society (sometimes it was the All Girl Squadron)?" This was followed by a long pause. "Major, why aren't your crew chiefs getting their paychecks on time?"*

incoming field grade officers arrived at the beginning of the month. A year later, they left Osan at the end of the month, making this nearly a 13-month tour of duty, a Murphy policy.)

Colonel Murphy interviewed all senior noncommissioned officers (NCO) and officers one-on-one within days of their arrival. This interview was strictly a one-way conversation. Here's the nature of my interview, as I've kept my notes over the years and used them myself.

- Be happy and aggressive.
- Know the -6.
- The squadron maintenance supervisor runs maintenance.
- Production belongs to the senior NCOs, not the officers.
- Identify weak people and press them to become stronger.
- Don't accept anything short of perfection.
- No battles, period.
- Quality assurance (QA) reports are to be answered with what we're doing to correct the problem.
- Know at what level decisions should be made and hold those people responsible.

In about 2 weeks, Murphy made his decision on assignments, and I was extremely fortunate to be selected to command the AGS, replacing the extremely popular and very competent Major Dick Rose.

In those days, Osan (51<sup>st</sup> Composite Wing) had 24 F-4Es, 16 OV-10s, and a full-time detachment of 6 RF-4Cs. The maintenance organization was an early production-oriented maintenance organization (POMO), with a DCM—Colonel Murphy, also known as *Alpha One*. While the tour of duty was nearly 13 months for most of us, certain key staff members served longer tours (Murphy served for 3 years).

My memory is very clear about those events 22 years ago, serving as AGS commander under Alpha One, and I would like to share some of those experiences with you.

Permit me to describe a standard day. It always began at 0430 (except for Sunday) with a phone call to my quarters. I was usually in the shower at that time and kept a close ear for the ring. It was Colonel Murphy. "Good

morning, are you the commander of the *Animal Gathering Society* (sometimes it was the *All Girl Squadron*)?" This was followed by a long pause. "Major, why aren't your crew chiefs getting their paychecks on time?" Or, "Why do your crew chiefs need haircuts?" Or, "When are you going to insist on clean forms on your airplanes?" Then, before I could answer, he would hang up. After a few of these calls, I became very annoyed, with him and with my inability to anticipate his daily questions. It soon became apparent that Alpha One cruised the flight line every morning from 0300 on, searching out *his people*, my crew chiefs. After several weeks of this, I eventually got used to it and followed up during the day, unless it was an airplane problem, which I investigated before I left my quarters in the morning.

I always stopped by job control before starting my rounds. Murphy's job control was unique, as were his expectations. Every decision that could be moved from job control to the flight line was, letting the AGS expediter work the problem through the specialist supervisors on the line and work out a course of action. Job control was to let that course of action stand unless they could prove it impacted future schedules—or other priorities to the on-scene bosses—to prepare aircraft to fly. Job control should keep reminding the flight line of considerations, and they should obtain the help on-scene bosses needed. Colonel Murphy considered the AGS expediter the orchestrator of the ongoing maintenance effort. He spent lots of time needling the specialist dispatchers for failing to keep the work force occupied when there was something productive they could be doing, such as dispatching avionics specialists to clear delayed discrepancies. He never let the shop chiefs forget they were the ones who should be bugging job control for an airframe or to do what needed to be done.

After establishing how the schedule was being met for the day, I usually visited each shelter that housed an aircraft on the day's flying schedule. Over time, you could tell just by looking at the activity (or listening to the radio) whether the bird was coming together or not. It was especially nice to have fewer than 50 airplanes—knowing tail numbers, locations, names of the crew chiefs, and the aircrafts' history wasn't difficult.

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## Murphy's Law

*In short, if aircraft 421 was scheduled to fly on Monday, Tuesday, and Thursday, it damn well flew on those days. No one substituted one airplane for another, or they would have been fired.*

Colonel Murphy's reputation, integrity, and work ethic centered on scheduling. With 27 F-4Es authorized and 24 or so on station (2 or 3 were often at programmed depot maintenance), his ironclad policy was to keep half of them on the ground for scheduled, unscheduled, and delayed maintenance; time compliance technical orders; washes; paint; weapons load training; and so forth. He forbade any tail number *swapping*, with the policy concurrence of the deputy commander for operations and the wing commander. In short, if aircraft 421 was scheduled to fly on Monday, Tuesday, and Thursday, it damn well flew on those days. No one substituted one airplane for another, or they would have been fired. Case closed. If the wing commander took aircraft 551 to Kunsan for a conference on Monday and returned that evening with it out of commission, it was not substituted if it wasn't able to fly as scheduled on Tuesday. That's what spares were for. On a typical day, using 11 jets, the schedule called for 9 + 3; that is, 8 + 3 spares on the first go. The turn was a diminishing rate, 8 + 4, then 7 + 5, and so on. I recall, quite early one morning when driving down B-ramp, seeing two crew chiefs scuffling in front of a shelter. I broke it up and asked why they were fighting. Colonel Murphy had been by that morning and said the crew chief of the aircraft flying the most sorties that day would get something special from him (probably a six-pack if memory serves me.) The scuffle broke out because one crew chief's airplane was a spare that day and he was being teased by the other guy because the spare would never be flown and was thus ineligible for the Alpha One *special*.

Combat turnarounds occurred almost every day. A special location was set up where returning jets were *combat turned*, engines running, weapons loading, refueling (engines were shut down), and overall servicing, including the through-flight inspection. We often *turned* aircraft in less than 30 minutes. Given the scheduling scenario of a diminishing number of follow-on sorties with each turn, there were always plenty of airplanes available, mainly because of the discipline Murphy had established for scheduled maintenance on nonfly days. That was the key to his extraordinary success. (From July 1978 to July 1979, the wing had an astonishing 1.02 sortie rate for the

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F-4E.) I cannot emphasize enough the discipline that made this system work. No one changed the weekly schedule, where tail number assignments were published. It was common at the end of the flying day to have airplanes fully mission capable and no pilots to fly them. There were no exceptions to the *no change* policy unless we had an operational readiness evaluation or operational readiness inspection (ORI), and obviously, the wing then had to generate *all* aircraft.

Perhaps now would be an appropriate time to share an event that occurred on 9 November 1978 during an ORI. At about 1700, following an especially tough flying day (one F-4 needed an engine change, and one had a serious fuel leak), the Pacific Air Forces (PACAF) ORI team landed after holding on final for an F-4 to be removed from the barrier. The senior maintenance inspector, Lieutenant Colonel Harry Blue, went directly to job control where the commanders and maintenance supervisors were assembled. Harry walked in, checked the status, got the *brief* from the maintenance control officer, and commented to me when he walked out, “You’ll never make it.” We had 24 F-4Es and about 15 OV-10s, and no one knew how many RF-4Cs Kadena would send us. Of the F-4s, five were in very serious shape, including one in phase and one in phase prep, besides the two with major problems mentioned above. We needed to generate all 24 F-4s in 12 hours, or by 0500 the next morning, to get the top rating. We returned to our squadrons, established the shifts, and subconsciously fretted over how in the *Sam Hill* we would get it done. Murphy always went to the officers club for dinner at about 1800. Always. There was a special maintenance table at the club in those days that sat about a dozen people. The head seat was Alpha One’s. No one else sat in that seat, unless it was a tourist (upon which Murphy would exit the club and go to his quarters). That infamous night, Murphy went to the club as usual, ate alone (the rest of us were sweating bricks on the flight line), and then went to his quarters on the hill. All night, we watched the activity on the line, and one by one, the jets came together. Murphy showed up at about 0400, just in time to watch the last of the engine changes—the engine run and the preflight completed about 5 minutes before

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## Murphy's Law

*“Jay, I spent months preparing you and the other members of my team to go to war. My goal was to put you all in a position to lead the effort, and you did. I wasn’t needed, and my presence would have had a negative impact on your efforts.” That was classic Crawford Murphy.*

the 12-hour generation expired. All 24 F-4s, OV-10s, and RF-4Cs were in-commission and preflighted. The ORI report read in part:

The professionalism displayed throughout the maintenance complex was the best observed in PACAF . . . . “Excellent” rating for the DCM complex . . . and, “highly commendable” on the unit’s miraculous recovery from severely degraded maintenance following an especially tough flying period.

Months later, during a rare post-dinner exchange with Alpha One, I asked him about that evening. “Colonel, during the most important period of time during our assignment here at Osan, you were in your quarters. I don’t understand.” His comment was enlightening, “Jay, I spent months preparing you and the other members of my team to go to war. My goal was to put you all in a position to lead the effort, and you did. I wasn’t needed, and my presence would have had a negative impact on your efforts.” That was classic Crawford Murphy.

Aside from the normal, day-to-day activities of a flying unit, our role as commanders was to deal with our people and their problems, with an unrelenting eye (and ear) on generating airplanes. Not that we had to have the job control net in our office (we didn’t), but our maintenance supervisors were always keeping us informed. Murphy made it very clear to all of us that *production* meant senior NCOs and *management* meant officers. The real power belonged to the E-6/E-7 line chiefs and our superintendents. The officers provided the wherewithal for them to do their job.

Which brings me to the subject of meetings under Alpha One. He believed big meetings with lots of people invited decisions to be made at too high a level. He felt that hardly ever in a meeting atmosphere does the DCM make a decision that couldn’t be made better by someone below him. He also said that because the boss in those circumstances seldom had enough information to make the right decision the decisions made were “usually unmade by sundown.” He believed the DCM should do only those things that only he could do. For example, he thought it was most absurd to have people call him to get approval for cannibalizations. Most of the decisions traditionally

reserved for DCMs were, in his view, inappropriate because they were decisions dealing with the minutiae of executing plans, programs, or schedules. Murphy decided, with advice, how many sorties to fly in a period and what patterns to use in scheduling. He would set the policy on what types of things to cann or what types of missions to support. That would allow others to make the right decisions on each occasion. So what about his meetings? There was only one, the *Seventeen-ten* (1710). The meeting was called by the noncommissioned officer in charge (NCOIC), Deficiency Analysis (an E-7) whenever there was a deviation from the day's flying schedule (air abort, ground abort, maintenance nondelivery). It didn't matter if it was triggered by a deviation at 1700 that day or 0730, and if there wasn't a deviation, there was no 1710. Each commander; maintenance supervisor; complex superintendent (a chief); QC officer; maintenance control officer; job control officer; and NCOIC, Deficiency Analysis showed up in Murphy's small office. There weren't enough seats, so one person stood (usually Captain "Bubba" Parker, my maintenance supervisor). The meeting began promptly at 1710. Murphy wanted the entire wing complex, most of whom had gone to their quarters by then, to know that the DCM complex was on point. The NCOIC, Deficiency Analysis opened the meeting by saying something like, "Aircraft 330 had a ground abort for a leaking brake," upon which Murphy would look right at me with hawklike eyes and ask why. Bubba would tell him the brakes had been changed in phase the day before, and Murphy would look at Luke and ask why. Captain Steve Smitherman, the Equipment Maintenance Squadron maintenance supervisor, would say, "Sir, the brake stack was installed backwards and Airman so-and-so was unsupervised, and Staff Sergeant Smith or Jones failed to do an IPI." Murphy would then look to the QC manager (Major Rich Romer) and ask why QC didn't catch it. Sometimes this dialog would last half an hour on each deviation until he was satisfied the root causes were discovered. Days with more than one deviation often had the 1710 go way past 1830. After deviations were discussed, every repeat and recurring writeup written since the last 1710 meeting was discussed.

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## Murphy's Law

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Sometimes, we hashed over scores of these with the same dissecting inquiry used on the deviations. At least, we had time to prepare for these. I recall never going more than a couple of days without a 1710 that year with mixed emotions, because if we had, it would have allowed a lot of repeat or recurring writeups to pile up.

After the 1710, most of us returned to our offices to wrap up the day and make sure the swing shift course was set. Then off to dinner at the officers club, where we would probably find Alpha One finishing his meal and others in various stages of dinner. The dinner period was enjoyable—not a lot of shoptalk—rather, poking fun at each other and once in awhile taking a fun shot at Colonel Murphy.

Once during our tour, each officer was invited to Murphy's quarters for homemade soup. That was a very special occasion, and surely, all of us have special memories of that event. The setting was a little awkward given the circumstances—a bachelor colonel's quarters—with classical music. The soup was superb. The evening lasted about 90 minutes, and then it was time to go. No shoptalk, just listening to him read some favorite poems or inquiries about our family and life.

Saturdays were like every other day for the most part, occasionally with only half a day flying. We never flew on Sunday. I used Sundays to spend quiet time with each airplane, without any company, to review the forms and evaluate the overall condition of the airplane. Dirty airplanes were not acceptable, and had Murphy found one to be unacceptable, I would catch hell. That included faded paint or greasy fingerprints on access panels. The crew chiefs knew it, too, as they were pampered by Alpha One almost to the point of fraternization. He knew them all by name, often their backgrounds and individual personalities. I recall the image of a crew chief leaning in the open window of Murphy's pickup truck at 0500 or 1000 or 1430, joking with their big boss. He loved those crew chiefs. He often had lunch with them in the flight-line cafeteria, a facility that he insisted on having near the troops.

I saw Colonel Murphy cry one time, and I hope he forgives me for bringing it up, but it shows the

compassionate side of this special person. One of his favorite crew chiefs was a staff sergeant who was on his third year at Osan. He was married to a Korean national and was also one of the most respected mechanics in the complex. This sergeant was indicted for black marketing activities (he sold a washing machine to a Korean). When Colonel Murphy learned of this, he cried like a baby. He was devastated. Murphy spoke on his behalf at the court martial in emotionally muted tones you could barely hear in the courtroom.

There are, of course, far too many memories to capture in this narrative about Alpha One. Each one of us was pushed to our full potential, and in my case, I carried his intensity and focus on to greater challenges in subsequent assignments. It became natural in the years following Osan, when faced with problems and decisions, to find the clear and correct course of action using the foundation provided by him. He was outspoken and light-years ahead of his time, but his focus was always the same. In my later active duty and Boeing years, some of my decisions were challenged and criticized, often by government agencies with a different agenda, but my bottom line was always a clear conscience with the knowledge that I had done the right thing. I owe that to Crawford O. Murphy.

Some of us stayed in touch with our old boss over the years. He retired in the early 1980s and returned to his birthplace and home in Cambridge, Maryland. There he was affectionately known as Neal. I visited him twice and found him to be very happy and comfortable. He remained a bit curt and always the disciplinarian but very modest and full of life. He passed away in the early 1990s.

Crawford Murphy should have been promoted again. He made colonel in less than 15 years, as a nonrated maintenance officer. His downside, I am told, was his impatience with higher headquarters and the reorganization of aircraft maintenance that was occurring in the Air Force. His attitude on that was unacceptable to his superiors, but he, nevertheless, voiced his objections at every opportunity. His messages were infamous. One I will never forget was known as the *Shah of Iran* message. It started out in a message to Third Air Force and PACAF. "I feel quite certain that the Shah of Iran thought the only

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## Murphy's Law

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with CIRF for 3  
years. He didn't  
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it.*

obstacles to his program were some older supervisors who were resisting change.” He then went on to outline two major logistics initiatives (POMO and centralized intermediate repair facility [CIRF]) in PACAF that he felt were detrimental to “flying plenty of safe and effective sorties,” his motto. He believed the idea of a self-sufficient aircraft maintenance unit (AMU), the heart of POMO, was an appealing idea. However, he also felt it took far more fully qualified and experienced technicians than we could afford, working in a more stable environment than we could provide. Additionally, he felt that the specialists, under POMO, were fragmented and that led to instability. Constantly moving and borrowing specialists between shops and other AMUs turned out to be an unsupervised nightmare and led to poor quality work. He also believed the quality of troubleshooting was reduced under POMO because complete malfunction histories were not readily available to supervisors. Finally, he believed qualified supervision was seriously reduced, primarily because the system would not provide the smaller work centers with the higher NCO grades previously authorized in the larger organizations.

Crawford Murphy worked with CIRF for 3 years. He didn't believe it enhanced our combat capability in Korea; he felt CIRF degraded it. Remember, he was managing F-4 and OV-10 aircraft with considerable intermediate-level maintenance requirements. The loss of a reparable asset out of the base-level maintenance system was unacceptable. He also felt that airlift, absolutely critical to a functioning CIRF, made the whole process extremely vulnerable in wartime. The loss of the base-level pipeline, from shop to flight line to supply, was simply unacceptable. His arguments continued with challenges to the economics of the system, the increased damages to avionics line-replaceable units, and loss of the capability to rapidly fix bad boxes during wartime.

In his end-of-tour report, he credited the “unparalleled cooperation of the aircrews and their bosses . . . who willingly did the mission in a fashion that provided us the best chance of success regardless of their personal druthers.”



- Commanders are supposed to command—maintenance control officers are supposed to stay in maintenance control and not bother anybody.
- Maintenance control officers are not supposed to be out on the flight line—that is squadron business, not maintenance control business.
- First of all, it's [maintenance] going to have one boss—me. I will not ask and do not expect either my assistant, my maintenance control officer, or my squadron commanders to set maintenance policy. I want one clear source of policy—me. However, I want my commanders to command. I do not want my staff to interfere in that command.
- The single most important thing controllable at wing level that will advance the sortie-production goal is to follow the weekly flying schedule. Once it has been decided which aircraft will fly on which days, do not change it. If you think just a few changes will be acceptable, you are wrong. When your people realize they can count on the schedule about as well as a sunrise, you can be sure they will fight to fly that schedule.
- I hear officers shy away from field assignments because the risks are high, exposure low, and the work hard and less forgiving. Base-level jobs were, in my opinion, the most difficult—and for me the most rewarding—and they were the ones where the rubber meets the road and the flying and fighting are done.
- Probably the most frustrating job is being my maintenance control officer. Most maintenance control officers think they control maintenance. I don't want that. I want him to coordinate all operations staff and supply matters and coordinate maintenance schedules. The NCOs on the flight line do a marvelous job controlling maintenance and do not need lots of direction. There is no need for directions from job control, just information and outside support.
- I expect being my assistant DCM must be a frustrating affair. I always instruct my assistant to not give any instructions or directions to maintenance people about the job of maintaining aircraft. I never ask him to catch

*The single most important thing controllable at wing level that will advance the sortie-production goal is to follow the weekly flying schedule.*

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## Murphy's Law

*I ask commanders to tell me why we have holes in the schedule and what they are doing to prevent it from happening again. It is useless to discuss preventive action unless you know who did what wrong.*

the overflow and do things that I don't have time to do. The assistant is responsible for civil engineering programming, manpower changes, communications, budget, programs and plans, and training. He is in charge of ORI procedures and maintenance manning in the command post during exercises and preparing nominations for unit and individual awards. Two areas that make me the most money are his actions in manpower and civil engineering matters. No one is usually working those areas daily to get results; he does and gets results.

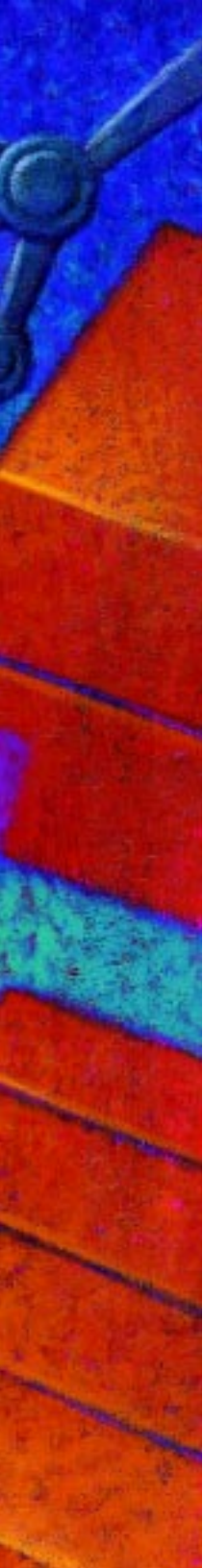
- I think all squadron commanders who work for me would agree there really are only a few things that I insist be done my way. They have more decision-making power than any maintenance squadron commander I know. One of my favorite answers to a question is, "I don't plan to answer that—you do what you want to do." If I think they made a dumb decision, I tell them, but I don't pull the decision up to my desk when they make a dumb one.
- I ask commanders to tell me why we have holes in the schedule and what they are doing to prevent it from happening again. It is useless to discuss preventive action unless you know who did what wrong. Only then can you find out why it is done wrong, identify the cause, and develop a good corrective action.
- Insist that your people be aggressive supervisors. Ask them to do the maximum, not the minimum acceptable. If they are the type person who will do only those things that, if left undone, you could prove they should have done, then they are meeting the standard. To be outstanding, they must do the things their bosses wouldn't even know they had the opportunity to do until they saw it done.
- I warn incoming supervisors they have two tasks anytime they receive a QA report: one, identify deficiencies and, two, do not debate the validity of the report. Once the report is written, the owner of the deficiency needs to fix the problem and prevent it from recurring as best he can. Reporting deficiencies is not a happy business. I want a ranking officer in QA. Only my assistant and I outrank him. Each morning before

0700, I have my QA officer bring me the results of the on-aircraft inspections of the last 24 hours. I want to be in a position to mention success and failure to those responsible as I visit them during the day. I see all QA reports when they have been completed to show cause and corrective action and preventive action. Most failures of QC control inspections are directly attributable to first-line supervisors; either they did not teach the failed technician how to do the job, or they did not insist that the technician do the job he was trained and directed to do.

**Notes**

1. Taken in part from "Compendium of Things," authored by Colonel Murphy, and sent to me in 1979.





**The Air Force supply officer career field has much opportunity, if the leaders and the officers in the career field are ready and willing to embrace change.**

# **Supply Officer** of the future

The Air Force is conducting a logistics transformation program, the Chief of Staff has directed an assessment of the logistics organization and career fields, there are ongoing reengineering initiatives in all logistics career fields, and the MAJCOMs are all looking for more effective and more efficient processes for logistics support.

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**Major General James W. Hopp, USAF, Retired**

## **Background**

The Air Force supply officer career field has much opportunity, if the leaders and the officers in the career field are ready and willing to embrace change. If not, the career field will become redundant and could be eliminated. Why do I say this?

First, the size of the Air Force is down dramatically—from around 600,000 active duty personnel in 1989 to fewer than 400,000 in 2000, a 40 percent reduction in active duty end strength. The Department of Defense budget has declined 28 percent since 1990, procurement spending has decreased by 53 percent, and operations and maintenance has been reduced by 15 percent. While this is not news, the pressure to continue reducing the support side of the equation is continuing and will increase in the years to come. Operations and procurement of new systems appear to have taken all the cuts they can afford.

Second, the way the Air Force will provide support to new weapon systems and, to some extent, existing systems will be significantly different than in the past. C-17 Flexible Sustainment,



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## Supply Officer of the Future



*There probably has never been a better time to make a change.*

F-117 Total System Performance Responsibility, and other concepts that provide contractor logistics support are either already in place or will be in the near term.

Third, there is a valid need for an officer corps that can provide what the commercial world refers to as *supply chain* expertise. While this is close to the skills many supply officers have developed, it is not reflected in the way the career field is described or in the training. Some of these changes include major command (MAJCOM) supply regionalization, loss of base service stores and individual equipment sections, increased use of the Government-wide Purchase Card, the Defense Logistics Agency's expanding use of prime and direct vendor delivery contracts, and the evolution of the Expeditionary Aerospace Force concept. The Air Force Deputy Chief of Staff for Installations and Logistics' transformation program will drive even more dramatic changes in the logistics processes.

Fourth, many of today's supply officer functions are similar to, or the same as, those taught in 1963 in the supply officers course at Amarillo AFB, Texas. That may not be bad, but it does not reflect what has happened in the commercial marketplace and what needs to happen in the Air Force.

Finally, there probably has never been a better time to make a change. The Air Force is conducting a logistics transformation program, the Chief of Staff has directed an assessment of the logistics organization and career fields, there are ongoing reengineering initiatives in all logistics career fields, and the MAJCOMs are all looking for more effective and more efficient processes for logistics support. Industry has shown they can *reinvent* the traditional supply functional experts into *supply chain* managers who have better career paths and contribute more to the operational and financial health of the company. The Air Force needs to do the same thing with its supply officer and other logistics functional career fields.

## Commercial Supply Chain Manager Model

Before discussing how to restructure the Air Force supply officer career field (AFSC 21SX), we need to compare it

to the typical commercial, supply chain management position and highlight some of the responsibilities of the commercial supply chain managers.

Air Force Manual (AFMAN) 36-2102 describes supply officer duties and responsibilities as:

Directs, manages, and operates supply, equipment, and fuels management systems; develops, formulates, and implements plans, programs, and policies to operate, manage, and administer current and projected supply and fuels management systems; requirements determination and computation; allowances and authorizations; inventory and distribution control; reporting; stock fund operating programs preparation; and operations operating budget preparation. May serve as an accountable officer.<sup>1</sup>

What are the typical duties involved in supply chain management? Companies tend to differ in how they describe the duties of a *supply chain manager*, but they all generally involve those duties described in this description and the following quote.

Simply stated, the supply chain encompasses those activities associated with moving goods from the raw-materials stage to the end user. This includes sourcing and procurement, production scheduling, order processing, inventory management, transportation, warehousing, and customer service. It also embodies the information systems so necessary to monitor these activities.

Successful supply chain management coordinates and integrates these activities into a seamless process. It embraces and links the partners in the chain. In addition to the departments within the organization, these partners include vendors, carriers, third-party companies, and information systems providers.<sup>2</sup>

Further, a description of the logistics professional in supply chain management includes the following quote from *Logistics! Candid Insights for Supply Chain Leaders*.

Today, a successful supply-chain leader serves as a natural facilitator and integrator between the divergent needs of sales and manufacturing, quality and price, cost and service, and financial and qualitative measures.

To assume this kind of quarterback position effectively, however, logistics professionals have to do a couple of things. For one, they must broaden their understanding of other business functions within their organization.

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## Supply Officer of the Future

*While there are many similarities in the major supply chain management functions in AFMAN 36-2105, the differences are dramatic.*

Specifically, they need to know more about purchasing and sourcing practices, production planning, marketing initiatives, and sales programs and promotions. They also must develop a more intimate knowledge of the customer, for as the new maxim goes: supply-chain management begins and ends with the customer.<sup>3</sup>

While each company may structure its positions differently or give the job a different title, the responsibilities are similar. The following are three supply chain manager position descriptions.

- **Supply Chain Manager** for a \$100M manufacturing company. Provides strategic direction and leadership to the purchasing and inventory groups in all activities related to the selection, procurement, receipt, and management of products and services. The successful candidate will manage inventory levels and develop a strategic materiel/procurement plan that supports the objectives of the organization. Strong involvement with vendor evaluation and relations, negotiating bids, and qualifying the vendor base to support enterprise-wide objectives.
- **Vice President of Operations** for an international paperboard, packaging, and building material company. Responsible for driving key initiatives for the organization. Requires background and hands-on experience in the areas of logistics, transportation, customer service, store operations, forecasting, and all supporting information systems. Additional responsibilities include leading and developing customer-integrated logistics initiatives to improve company services and cost relationship with the customer. Participates in strategy development with a broad consumer/retail customer base. Creates linkage within team and across teams for all logistics, forecasting, and customer service initiatives. Ensures inventory to support both new product availability and promotion activity. Effectively manages all integrated logistics and customer service initiatives.
- **Senior Manager/Associate Partner for Supply Chain Management** for a major consulting firm. Requires strong experience in one or more of the

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following areas of supply chain optimization: (1) e-procurement, (2) advanced planning systems, (3) e-fulfillment (online order processing/returns), and (4) systems integration (information technology delivery of supply chain systems/implementation—integration).

While there are many similarities in the major supply chain management (SCM) functions in AFMAN 36-2105, the differences are dramatic. The commercial SCM manager has a much broader responsibility for the entire process of determining what is required; purchasing, transporting, storing, and issuing; planning production and repair of an item; and ensuring the customer is properly supported. The Air Force supply officer has no responsibility for acquisition, transportation, or production/repair planning. These functions are performed and directed by different career fields. Yet, the supply officer is the one to whom the wing commander turns to ensure the necessary parts are available to meet sortie requirements.

### **What Should the *Reinvented* Supply Officer Career Field Look Like?**

The supply officer of the 21<sup>st</sup> century Air Force, with the principal duty of supporting the Aerospace Expeditionary Force (AEF), should be an officer who is trained to perform the traditional functions associated with logistics plans, supply, acquisition (procurement), component repair, and transportation currently performed by five separate career fields. This reinvented career field should be called the *logistics support officer*.

This *logistics support officer* should be the single point of contact for the wing commander, logistics group commander, or operations squadron commander for anything and everything to do with getting parts or logistics services to satisfy mission needs. This person does not have to actually do the work but must ensure it is done. For example, if an operations squadron needs to have a service contract for logistics support of a mission planning system and the inventory manager does not provide the support, then the *logistics support officer* should be able to determine what company can provide

### **Supply Officer of the Future**

*The supply officer of the 21<sup>st</sup> century Air Force, with the principal duty of supporting the Aerospace Expeditionary Force, should be an officer who is trained to perform the traditional functions associated with logistics plans, supply, acquisition (procurement), component repair, and transportation currently performed by five separate career fields.*

Supply Officer of the Future

*Acquiring parts or repairs needed on an emergency basis is another case where the logistics support officer should provide the service without having to go through the contracting activity.*

SCM Function	AFSC 21SX	Commercial SCM
Initial Requirements Provisioning (Sourcing)	X	X
Initial Requirements Acquisition	X	X
Initial Requirements Transportation	-	X
Production and Repair Planning	-	X
Transportation Planning	-	X
Long-Term Requirements Planning	X	X
Supply Budget Preparation and Execution	X	X
Replenishment Requirements Determination	X	X
Replenishment Acquisition	-	X
Production and Repair Scheduling	-	X
Order Management	X	X
Inventory/Materiel Management	X	X
Warehousing and Issue	X	X
Customer Service	X	X
Disposal	X	-
Logistics Information Systems	X	X

**Table 1. Comparison of Major Supply Chain Management Functions<sup>4</sup>**

the best service and direct the award of the contract using e-procurement or other web-enabled techniques.

To illustrate the differences between the commercial supply chain manager's and the military supply officer's responsibilities, consider a few examples.

Acquiring parts or repairs needed on an emergency basis is another case where the logistics support officer should provide the service without having to go through the contracting activity. These steps add time and cost but do not add value. That is why they have been eliminated in industry. If the logistics support officer is the *contracting authority*, the processes will allow this support to be obtained from the fastest and most efficient source

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available, without the delays that result from having to pass purchase orders from office to office.

In the area of fast transportation, the logistics support officer should also be able to direct the manner and speed of the shipment to and from the base to meet operational needs and budget restrictions. For example, how many of you order from a catalog or from an online web site? You decide at the time of your order if you want to pay for premium transportation or allow the shipper to decide, based on when you need the item. There is no reason in today's e-commerce environment that logistics support officers should not be able to do the same thing.

In the commercial example, the supply chain manager would not have to go through all the *hoops* or prepare all the paperwork that must be generated to do a similar task in the Air Force. The requirements are the same, and the process should be the same. The appropriate checks and balances could be established to meet the requirements of the *Federal Acquisition Regulation* (FAR). Better still, maybe the FAR restrictions should be removed as an acquisition reform initiative to permit a more flexible and effective support process.

### **So How Do We Create this Logistics Support Officer?**

First, determine what functions a logistics support officer needs to provide support to the AEF wing commander at both the home station and in the deployed operational environment.

Second, design the technical schools to teach young officers to use their brains and the skills they bring with them into the Air Force. They know how to use the web. Allow them to use sites like *buy.com*, *myaircraft.com*, *Exostar.com*, *aerospan.com*, and others to buy authorized items and services. Laws and regulations must be addressed to ensure correct parts and services are being procured, but this can be done using the Assistant Secretary of the Air Force Acquisition Lightning Bolt process.

Third, define what can and cannot be bought at the local level and what can and cannot be bought without a contracting officer's warrant. There may even be a point

Supply Officer of  
the Future

*The supply chain manager would not have to go through all the hoops or prepare all the paperwork that must be generated to do a similar task in the Air Force.*

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## Supply Officer of the Future

*Create a career path that begins with second lieutenants to lieutenant colonels learning the intricacies of the contracting, logistics plans, supply, and transportation fields through both technical schools and field experience.*

where logistics support officers have warrants up to certain levels. The list for what cannot be bought should be fairly short. It should not be used as a way to keep jobs in a career field but should be limited to items and/or services that are safety of flight or engineering critical at the field level or specifically mandated by public law.

Fourth, create a career path that begins with second lieutenants to lieutenant colonels learning the intricacies of the contracting, logistics plans, supply, and transportation fields through both technical schools and field experience. Eliminate stovepipe schools and training paths and create a consolidated career path from the start, creating a multitasked officer. All career fields multitask their officers today, and they can handle the complexities of the various logistics disciplines. In this way, when officers are ready for squadron command, they will be better prepared to lead a *consolidated logistics squadron*. This logistics squadron would replace the current supply, transportation, and contracting squadrons and be responsible for supporting all facets of the wing's mission in the logistics functional disciplines.

## Conclusion

You may not agree, but at least look at both the positive and negative aspects from the standpoint of what is best for the Air Force and its officers in the 21<sup>st</sup> century. One of my greatest regrets is that I did not initiate the discussion of more dramatic changes when I was the Director of Supply. I am not sure I could have gotten anyone to listen, but we could have had some interesting discussions.

The Air Force is not a business, and there are a lot of what some call *inefficiencies* in how supply and logistics business is done today, especially in support of the deployed units. Some of these *inefficiencies* are necessary to ensure the support required to respond with little notice to contingency operations. However, I reject the argument that, because the supply officer supports the warfighter, we cannot be more effective and efficient in how we do the job. The idea that we are so different or unique we cannot use commercial models will not wash anymore.

An opportunity exists for Air Force supply (and logistics) leaders to be creative in planning how the career

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field should evolve. If they do not seize the opportunity, the career field will become redundant, and the career path will stagnate and could be eliminated. We owe it to the officers in the supply career field to maintain a viable, effective career path, one that supports the warfighter in the most effective and efficient manner possible. Moreover, the supply officer is uniquely positioned to be the centerpiece to implement the new SCM capabilities to support the AEF. This new career field can be the bridge between planning and execution of the reengineered AEF support patterns.

Now is the time to look creatively at how the current supply officer and other logistics functional officer career fields can be combined to better support the Air Force and provide a better career path for the officers who will follow.

#### Notes


1. *Air Force Manual 36-2105*, Attachment 6, 11 Mar 98.
2. "What's the Buzz? (Supply Chain Management), Logistics Management, 1 Feb 97, 1.
3. "What's the Buzz?" 5.
4. *Air Force Manual 36-21105*.

#### Supply Officer of the Future

*The Air Force is not a business, and there are a lot of what some call inefficiencies in how supply and logistics business is done today, especially in support of the deployed units.*







**Military aviation maintenance support strategies are undergoing significant transformation in the aftermath of the Cold War.**

# **Maintenance**

## **support strategies**

Geostrategic, economic, and technological changes will make support of air operations, both at home and overseas, increasingly dependent on the flexibility and responsiveness of the military logistic organization. This requires the creation of a highly integrated and agile support chain with global reach.

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**Air Commodore Peter J. Dye, RAF**

**M**ilitary aviation maintenance support strategies are undergoing significant transformation in the aftermath of the Cold War. Organizational changes designed to reduce the cost and development time scales for new weapon systems and enhance the support of deployed, joint operations are set to radically alter military logistics. The main focus is on reducing logistic support costs while improving operational output. This requires the creation of a highly responsive and agile support chain with global reach. A key enabler in this process is the development of partnering arrangements between government and industry.

Existing military aviation strategies have been shaped by a number of environmental factors, of an operational or budgetary nature, not shared with the commercial maintenance repair and overhaul sector. There is, nevertheless, scope for cost reduction through the employment of a variety of business improvement tools and techniques, including process acceleration and improved materiel and production planning. However, the significant improvements required in the overall cost of ownership can only be delivered if the entire support chain is managed as a coherent entity and optimized end to end.

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## Maintenance Support Strategies



*Partnering offers the prospect that the varied stakeholders can work together effectively to reduce logistic output costs and improve operational availability.*

To date, strategies to shape the support chain have centred largely on outsourcing and rationalisation, relying on competition to deliver the best value for money. Partnering offers the prospect that the varied stakeholders can work together effectively to reduce logistic output costs and improve operational availability. While it is likely that the military logistic organization will continue to embrace depot-level activities, they may well be on a smaller scale than at present and possibly managed under joint arrangements that partner the front-line, fleet managers, industry and in-house repair agencies. Whatever the outcome, the military customer will properly continue to be responsible for determining the required outputs, setting of priorities, and overall integration of the support chain.

The fundamental building block in achieving an effective partnering environment will be the creation of trust between the individual stakeholders. This requires a joint management approach, underpinned by spares-inclusive, long-term contracts with clear gain-share opportunities for all those involved. Success will be measured by a reduction in inventories, faster turn round of aircraft and high-value rotables, more rapid embodiment of modifications, quicker introduction of new technologies, a smaller expeditionary footprint, and greater operational output.

Maintaining military aircraft has always been a challenging and dynamic business, but today it is in the throes of radical change as air forces shape their logistic systems to post Cold War realities. Support strategies have had to be developed that address very different budgetary, technological, and operational requirements. This article examines these issues from a British perspective and draws heavily on the experience of the Defence Aviation Repair Agency (DARA), formed in April 1999, to manage the aviation maintenance and repair facilities of the Royal Air Force (RAF) and the Royal Navy in support of the United Kingdom's (UK) Armed Forces.

## Background

A number of recent defence initiatives have had a direct impact on the UK's military aviation maintenance support



strategies. Many of the resulting organizational and process changes have yet to be fully realized but, together with the lessons identified in the Gulf War and more recently in the Balkans, are likely to transform the way in which airpower and military capability, in general, are delivered and weapons systems supported both at home and in the field.

## Strategic Defence Review

The UK's Strategic Defence Review (SDR), completed in 1998, has been central to shaping future logistic support arrangements for the RAF.<sup>1</sup> The two elements bearing most directly on the existing logistic organization are the Smart Procurement Initiative (SPI)—which seeks to ensure future equipment procurement is *faster, cheaper, and better*—and the formation of the Defence Logistics Organization (DLO).

SPI requires a much closer working relationship with industry in the procurement of new weapons systems with an emphasis on a *through-life approach*. The intention is to provide greater scope for tradeoffs between military effectiveness, time, and the whole-life cost of the equipment. Partnering between government and industry is a key enabler, together with improved commercial practices and the creation of an integrated team responsible for project management. The intent is to deliver greater operational capability with improved in-service support and lower through-life costs. More than 130 integrated project teams (IPT) have been formed, bringing together different functions at appropriate points in a project including requirements, procurement, contracts, finance, and logistic staffs within the Ministry of Defense (MoD) with representatives from industry.

There are obvious parallels between the SPI and the US Department of Defense Acquisition Reform and Lean Aircraft initiatives that similarly seek to reduce the costs and length of new weapons programmes by matching best practice and seeking greater partnering with industry.<sup>2</sup>

## Defence Logistic Organization

In the past, the individual Services have been largely responsible for their own logistic arrangements. Experience has shown that this does not provide for

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## Maintenance Support Strategies

*The joint commander of deployed forces must be able to exercise effective control over the entire support chain, which should, in turn, be flexible and capable of adjusting rapidly to new priorities.*

adequate support of forces engaged in the diverse, joint, deployed operations that characterise today's military environment. The joint commander of deployed forces must be able to exercise effective control over the entire support chain, which should, in turn, be flexible and capable of adjusting rapidly to new priorities. The fundamental change, however, has been the creation of a single, joint logistic organization under the Chief of Defence Logistics (CDL). CDL's remit is to provide support to the UK's Armed Forces that is effective, efficient, integrated, and responsive. The DLO has been structured to achieve these aims through an integrated logistic organization that provides a pan-defence overview allied to greatly strengthened logistics planning. It seeks implementation of best practice, rationalization of functions and capabilities, and the introduction of innovative ideas through the use of information technology and partnerships with industry.

The DLO comprises some 41,000 people, Service and civilian, based at more than 80 locations and with operating costs of nearly £5bn (about 20 percent of the UK's total defence budget). The DLO has an important part to play in implementing the SPI, and 60 of the new IPTs have already formed within the organization. Additional initiatives are in hand, for example, to introduce *lean* principles and rationalise the provision of logistic support. Among the early steps has been the creation of the DARA to repair and overhaul all the UK's military aircraft, both fixed-wing and helicopters.

## Environmental Factors

As important as these recent policy initiatives are proving, the fundamental shape of military aviation maintenance has been historically determined by a number of key *environmental* factors. While many of these also impact the commercial sector, the maintenance, repair, and overhaul (MRO) of military aircraft remains distinct in several respects.

## Operational Drivers

Operational drivers have always played a significant part in determining military aviation support strategies. In the past, the focus has been more on brute force than subtle,

flexible, and cost-conscious arrangements. While the Cold War lasted, this was an entirely reasonable and affordable approach.

Last year, the RAF was, on average, actively involved in five separate concurrent operations requiring the deployment of some 3,000-4,000 personnel and more than 70 aircraft. These have ranged from continuing support for the North Atlantic Treaty Organization in Bosnia to active operations with the United Nations in West Africa. The focus on expeditionary warfare reflects the significant change in operational posture that has occurred in the last 10 years.

Expeditionary warfare has altered the demands placed on the RAF's logistic system. Rather than the large-scale attritional scenario of the Cold War, smaller, more mobile but highly capable forces are required to be deployed at short notice, possibly concurrently, anywhere in the world. Demanding time scales require logistic units to set up quickly with the minimum deployment footprint yet remain responsive to rapidly changing operational needs. This, in turn, requires the support chain to function in a more agile and coherent manner to ensure operations can commence rapidly and then continue at the required intensity.

### **Defence Output**

Airpower is an increasingly important element in the delivery of military power. As the role of air forces has grown, so, too, has the need for greater weapons accuracy, effectiveness, and discrimination under all conditions and in all weathers. The requirement of modern, coalition warfare has added interoperability, minimum collateral damage, and survivability to the traditional mantra of flexibility, responsiveness, and reach. Increasingly, therefore, the emphasis is on sustaining the highest level of operational capability. This has huge implications for military aviation logistic organizations and has redoubled the emphasis on achieving faster modification embodiment and more responsive supply systems in order to be able to deploy and support the new technologies.

### **Aging Fleets**

A major factor to be addressed in managing support costs is the steady increase in the age of military aircraft fleets.

*Airpower is an increasingly important element in the delivery of military power. As the role of air forces has grown, so, too, has the need for greater weapons accuracy, effectiveness, and discrimination under all conditions and in all weathers.*

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## Maintenance Support Strategies

*Advances in technology provide the military planner with a significant challenge.*

The average age of aircraft in the US Air Force (USAF) front-line fleet is currently around 20 years but is set to rise to nearly 30 years over the next decade, notwithstanding the number of new aircraft types planned to be introduced. Indeed, the average age of the oldest aircraft type in the inventory will exceed 50 years by 2015.<sup>3</sup> Although substantially smaller, the average age of the RAF's front-line fleet, presently around 20 years, is also set to grow (Figure 1).

With increasing age comes increased risk of structural damage, corrosion, and general wear of systems such as utilities, flying controls, and landing gear. The effort to reduce support costs becomes an even greater challenge with an aging fleet where maintenance is dominated by parts obsolescence, fatigue, and an increasing proportion of emergent work driven by unforeseen airframe and engine problems.

### Technology

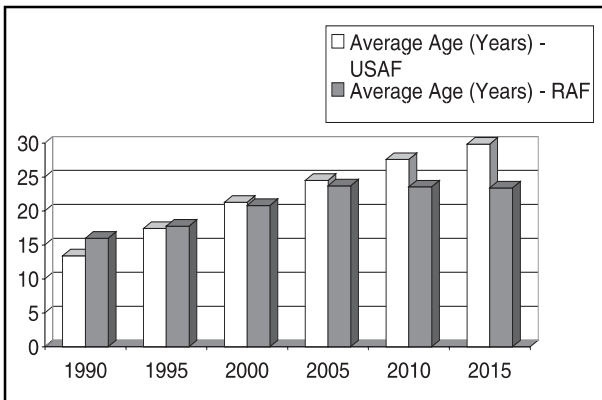
Advances in technology provide the military planner with a significant challenge. The pace of change is accelerating with much of the impetus coming from the commercial sector. This provides obvious difficulties in sustaining future military capability and complicates the task of predicting where technologies will lead. Accordingly, one of the key aims of the SPI is to allow operational capability to be sustained through technological insertion programmes.

On the positive side, new technology is now offering significantly improved reliabilities, notably, but not exclusively, in the avionics field. It has to be added, however, that this can also serve to exacerbate the obsolescence problem, as electronic components are rapidly superseded and no longer supported by the marketplace.

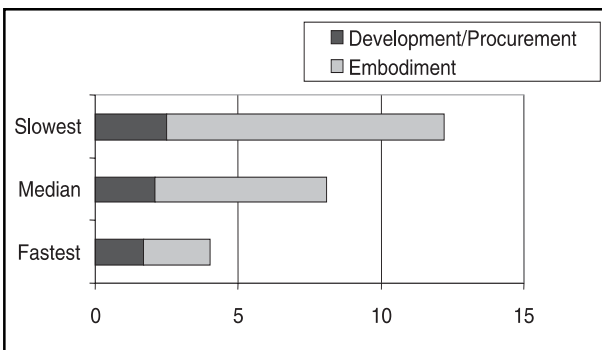
### Modification Embodiment

As technology surges ahead and fleets get older, so modification of in-service weapon systems has assumed steadily greater importance. In 1997-1998, the MoD spent £1bn (some 12 percent of all equipment-related

expenditure) modifying in-service equipment to sustain existing capabilities and meet emerging or new operational threats. An increasing proportion of aircraft downtimes is utilised to modify and upgrade weapons systems. Unfortunately, the idea of sustaining a single modification standard across an aircraft fleet has largely proved impracticable in the face of limited resources and time constraints. *Fleets within fleets* have emerged as modifications have taken years, if not decades, to be fully realized. For the Tornado (Figure 2), the fastest modifications have taken 4 years from development to fleet embodiment and the slowest 12 years.<sup>4</sup> Clearly, such delays have significant operational, maintenance, and training implications.



**Figure 1. Aging Aircraft Fleets**



**Figure 2. Tornado Modification Time Scales**

*As technology surges ahead and fleets get older, so modification of in-service weapon systems has assumed steadily greater importance.*



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## Maintenance Support Strategies

*The effective logistic support of a front-line squadron is an expensive business, involving a number of key stakeholders and embracing a variety of activities.*

A secondary, but important, aspect of the increasing pace of modification activity is that it has seen a modest shift from airframe and engine work in favour of electrical and avionic activity. Since the latter often focuses on the cockpit, where access is limited, scheduling and planning have become even more critical for achieving rapid turn-round times.

### Budgets

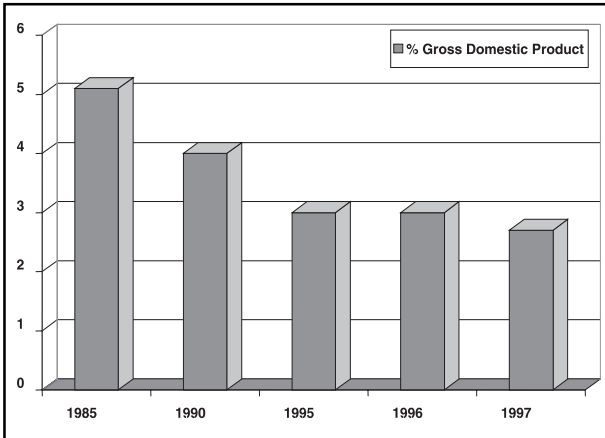
Over the last 10 years defence budgets have fallen in line with a smaller front line and reducing uniformed numbers. In the case of the UK's Armed Forces, the defence budget has fallen from a little more than 5 percent of the Gross Domestic Product in 1985 to less than 3 percent today (Figure 3). In the same period, the size of the RAF has shrunk from a total of 90,000 uniformed people to some 50,000. Sustaining a credible and operationally effective front line under these circumstances represents a major challenge, made all the more difficult by the tendency for defence prices to increase faster than general inflation in the economy.

Given the continuing pressures on the defence budget and the size and cost of the MoD's logistic organization, it will not be a surprise to learn that CDL is committed to reducing the output costs of logistic support by 20 percent over the next 5 years. It is planned that these efficiencies will, in turn, help free the resources needed to sustain the front line's operational capabilities.

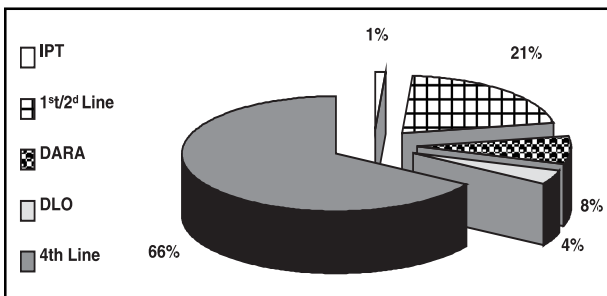
### Potential for Cost Reduction

The effective logistic support of a front-line squadron is an expensive business, involving a number of key stakeholders and embracing a variety of activities. The total operating budget for the support elements of the RAF's Tornado fleet, comprising more than 300 aircraft, is in excess of £1bn a year, of which the cash cost—excluding fuel, engines, and weapons—totals more than £700M. There are at least five separate organizations with a direct involvement in the management of the Tornado support chain (Figure 4).<sup>5</sup>

For those unfamiliar with the terms employed, the 1<sup>st</sup>/2<sup>d</sup> Line describes the engineering and maintenance activities carried out by the front line, within the



**Figure 3. UK Defence Expenditure**



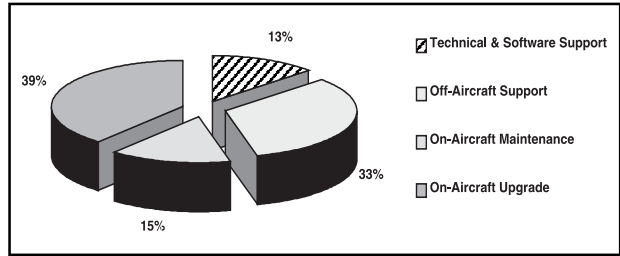
**Figure 4. Annual Tornado Support Budget**

competence of the operational unit (equivalent to the base and intermediate levels of the USAF maintenance model). Third Line (depot level), in this case the DARA, comprises those activities carried out within the Service but outside 1<sup>st</sup>/2<sup>d</sup> Line's competence and, therefore, is generally located off base. The 4<sup>th</sup> Line embraces all other maintenance activities carried out by external agencies and is, in effect, synonymous with industry.

If these activities are analysed by process, the importance of upgrade work, as a proportion of the overall support costs, becomes readily apparent (Figure 5). While the current midlife upgrade programme for the Tornado undoubtedly influences the pattern of resource allocation, the picture is not radically different to that found in other front-line fleets.

## Maintenance Support Strategies

*Shorter turn-round times for maintenance and modification activities not only offer the prospect of higher availability levels but also attract lower overheads and enhanced production efficiencies.*



**Figure 5. Tornado Support Activities by Process**

### Key Enablers

There are a variety of enablers critical to the effective management of military MRO. Many of these involve the employment of tools and techniques already widely used within the commercial MRO sector. However, because of operational drivers, progress toward best practice has been mixed and implementation patchy.

### Software Solutions

The introduction of electronic business systems for military aviation maintenance has been relatively slow compared to the pace in the wider aerospace market. Capacity planning and work scheduling tools, such as Manufacturing Resource Planning (MRP) and Enterprise Resource Planning (ERP), have been increasingly introduced in the last 5 years but are still rare in the military maintenance environment. This applies equally to the use of e-business tools which, while still modest, is growing rapidly in the private sector. In the United Kingdom, the MoD has recently initiated the Defence Electronic Commerce Service (DECS) to assist the DLO to exploit the huge opportunities offered by e-business and to facilitate supply chain integration.

### Reduced Turn-Round Times

Shorter turn-round times for maintenance and modification activities not only offer the prospect of higher availability levels but also attract lower overheads and enhanced production efficiencies. Thus, greater operational capability can be purchased at a lower overall cost to the defence budget. This virtuous circle, however, requires very different organizational and cultural

behaviours on the part of the supply chain stakeholders. Inevitably, there will be greater vulnerability to the impact of poor planning or the late arrival of spares, modification kits, and repair information.

## Process Acceleration

Process acceleration is central to many of the improvements required to be able to deliver improved logistic support and lower output costs. There is huge potential for improvement across all maintenance processes and levels. Process acceleration seeks to minimize turn-round times, reduce waste, eliminate waiting time, and drive down costs. Within the DARA, notable successes have included reducing the turn-round time for overhaul of the Lynx helicopter main gearbox from 131 days to just 16 days (Figure 6) and for overhaul of the RB 199 high-pressure Compressor, fitted to the Tornado, from 336 hours to 55 hours.

Similar achievements have been delivered in the electronics area and on aircraft maintenance where the current Tornado F3 2000 modification programme has seen a 25 percent reduction in the turn-round time, the elimination of some 600 hours of waste, and introduction of better working conditions through a variety of housekeeping initiatives. It is anticipated that aircraft scheduled maintenance down times can be reduced by 20-40 percent over the next 18 months. The capacity so released can be employed to accelerate the overall maintenance programme and achieve earlier fleet modification embodiment to increase repayment work or to facilitate a reduction in infrastructure costs through rationalisation.<sup>6</sup>

*Process acceleration seeks to minimize turn-round times, reduce waste, eliminate waiting time, and drive down costs.*

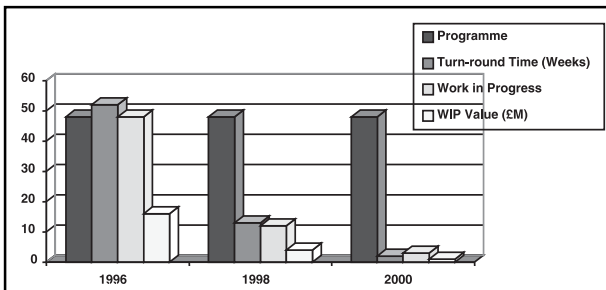


Figure 6. Process Acceleration—LYNX Main Gearbox

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## Maintenance Support Strategies

*A perennial problem faced in the struggle to achieve turn-round times for aircraft maintenance programmes and military MRO, in general, is the availability of spares, modification kits, and repair information.*

Additional benefits from these initiatives include reduced work in progress; greater ownership on the part of the work force of the processes involved; improved visibility of the key enablers, particularly spares; and the potential for significantly reduced inventories (including high-value rotables) across the entire supply chain while delivering improved availability. To provide some feel for the scale of the potential savings, it should be noted that the DLO's current avionics and electronics inventory is alone valued at £3.2bn of which £2.4bn are reparable, while the overall aviation-related inventory is probably closer to £8bn.

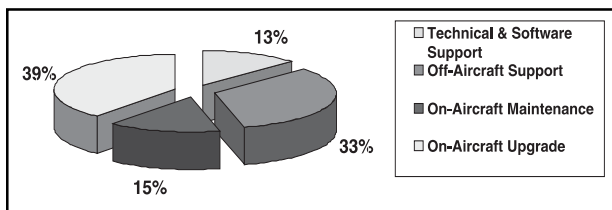
### Continuous Improvement

The techniques used to deliver process acceleration also form the basis for continuous improvement programmes intended to sustain the delivery of lower support costs. The major aerospace companies already sponsor such initiatives built around a variety of improvement tools and techniques and waste reduction principles. It seems probable that, as partnering arrangements find wider application, so industry-sponsored programmes such as BAE Systems' Supply Excellence Programme will find wider use in military aviation maintenance management.<sup>7</sup>

### Spares and Repair Information

A perennial problem faced in the struggle to achieve turn-round times for aircraft maintenance programmes and military MRO, in general, is the availability of spares, modification kits, and repair information. Spares-related problems account for some 38 percent of the delays currently experienced by the DARA's fixed-wing aircraft programmes (Figure 7). Other significant causes of delay are the late arrival of repair information, inadequate bay support, and engineering problems (emergent work, flight-test failures, and so forth).

Addressing these issues requires a greater emphasis on planning and materiel management within the repair organization in order to provide the wider support chain with credible and timely information on spares requirements. Much of this work can be achieved some time in advance (at least 18 months), and while there are obvious limits as to what can be achieved in the face of



**Figure 7. Average Aircraft Programme Delays (By Cause)**

procurement lead times and fleet-wide shortages, it is possible to achieve a significant reduction in spares-related delays, particularly if a way can be found to enable the supply base to work together and break away from the traditional consumption-driven approach to spares provisioning.

### Support Chain Strategies

Over recent years, a variety of strategies have been employed to shape the military aviation support chain, including competition, outsourcing, and privatization. All these remain important tools for delivering better value for money in the provision of logistic support and have been implemented within the RAF and USAF maintenance organizations with varying degrees of success. However, it has to be said that none have successfully addressed the fundamental need to manage the entire support chain in a manner that balances lower output costs with enhanced military capability.

Part of the difficulty is that there has been a continuing debate, on both sides of the Atlantic, about the strategic need for government-owned military aviation repair facilities. This has tended to cloud the issue and frustrate agreement on appropriate strategies. A further complication has been the development of innovative contracting strategies, such as Contractor Logistic Support and Prime Vendor Support that seek to address the logistic needs of individual weapon systems. While these total support packages have undoubtedly had an impact on the wider military aviation support chain, their scope has been intentionally narrow and invariably lacking in any overall strategic concept.

As more capability is imbedded in a smaller number of weapons platforms, it becomes all the more important

## Maintenance Support Strategies

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## Maintenance Support Strategies

*Even where maintenance activities remain in house, there is a potential for reshaping the logistic organization across the various levels as has been achieved through the USAF two-level maintenance initiative.*

that the highest level of availability is sustained with the lowest possible maintenance downtime. While the individual enablers described earlier are clearly important to more effective maintenance and supply performance, significant operational gain can be delivered only if the entire support chain, across all maintenance levels, is managed as an entity. Logistic arrangements can then be optimized to lower overall support costs and deliver a sustainable operational output. Before looking at how this might be achieved in the future, it may be helpful to look in a little more detail at the strategies employed to date.

### **Rationalisation**

Considerable rationalisation across the military aviation support chain has already occurred. In the last 10 years, the RAF has closed or amalgamated six out of eight logistic depots. Even so, there remains scope for further rationalisation of maintenance facilities in order to derive efficiencies of scale and exploit available synergies. There are self-evident limits to this process, but it seems likely that further rationalisation will occur as integrated logistic support arrangements are put in place.

Even where maintenance activities remain in house, there is a potential for reshaping the logistic organization across the various levels as has been achieved through the USAF two-level maintenance initiative. This has successfully removed a great deal of the intermediate-level capability with a commensurate decrease in the deployment footprint and greatly improved supply chain performance.<sup>8</sup>

### **Privatization**

Total privatization has, to date, remained unattractive in the face of strong strategic reasons to retain an organic (in-house) capability. These have included the need for a surge and reinforcement capability, the provision of an intelligent-customer role, maintaining a benchmark against which to judge industrial performance, and the avoidance of a monopoly situation. Thus, while value for money will always be critical, it seems likely that a proportion of on-aircraft military maintenance will continue to be undertaken in-house, just as the majority

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(some 73 percent) of airline maintenance is conducted in house.<sup>9</sup>

## Maintenance Support Strategies

### Competition

Competition in the allocation of specific maintenance contracts has been widely and successfully employed, although there are lingering arguments about the fairness of the process (the *level-playing-field* question). Even so, it is probable that an increasing proportion of off-and-on aircraft maintenance will be competed, although it may prove more effective for partners to agree where the work is actually undertaken rather than allowing a head-to-head fight determine the outcome.

### Outsourcing and Contractorization

The economic advantages of outsourcing and contractorization at a time of declining budgets are self-evident. As a result, the level of outsourcing is growing both in the general logistic area and in the direct support of combat operations. Competition, privatization, and the increasing employment of innovative contracting strategies mean that, in the future, a significant number of contractor people will be engaged in the delivery of military logistics, including aviation maintenance.<sup>10</sup>

### Partnering

While partnering is perhaps the most immature strategy deployed so far, it is perceived as the one offering with the greatest potential. Given the range of stakeholders with direct responsibility for or influence over the supply chain, partnering appears to offer the only practical mechanism to achieve the necessary oversight and control. Of course, this also requires that the proper incentives be put in place. Reducing support costs is as much about changing behaviour as about changing processes. Partnering is critical to achieving the necessary changes in the relationship between customer and supplier and the delivery of cost reduction, better service, and an overall improvement in effectiveness and quality.

Two basic forms of partnering have been developed by the MoD: Project Partnering involving individual projects, a particular service, or an aspect of equipment support and Strategic Partnering involving the building of

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## Maintenance Support Strategies

*Areas to be examined include process acceleration across a range of high-value rotables, improved strip-to-work ratios for on-aircraft maintenance, integrated software support, joint fleet management, more rapid modification embodiment, and faster provision of technical information and other post-design services.*

a long-term relationship to develop technological and strategic initiatives for the generation of income and shared efficiency savings. The aim is to construct a more flexible relationship with the private sector, rather than replacing the traditional contracting and competition processes.

### **Project Partnering**

A good example of Project Partnering is the recent contract between the Tornado IPT and the Original Equipment Manufacturer (OEM) for the provision of Tornado taileron and rudder actuators. The OEM is responsible for the entire support chain from 2<sup>d</sup> to 4<sup>th</sup> Line and is contracted to deliver a level of service defined by an achieved flying rate. As a result, aircraft-on-ground rates have fallen, and availability significantly improved. The DARA acts as a subcontractor to the OEM, sustaining an organic capability while contributing directly to a more effective and responsive support arrangement that has achieved real operational benefits. DARA is also acting as a subcontractor to BAE Systems on several aircraft modification programmes, such as the Hawk Fuselage Replacement Programme, won in open competition with industry. It is probable that an increasing proportion of DARA's work will be delivered under these or similar arrangements.

### **Strategic Partnering**

The formation of the DLO has seen the creation of a number of joint MoD/industry tiger teams to review the support of entire weapon systems, classes of equipment, and specific supply chain activities. These ad hoc, multidisciplinary teams have been created to provide a focussed and aggressive review of support strategies drawing on best practice and seeking innovative solutions. The Tornado Tiger Team—comprising representatives from the IPT, BAE Systems, the frontline, and the DARA—has recently identified ways to deliver more than 20 percent savings in life-cycle costs for the Tornado fleet over the next 4 years. The intention is to create a partnered support solution built on a joint management structure involving all the key stakeholders. The contracting arrangements have yet to be finalized, and other

stakeholders may yet join the partnering relationship, but pilot projects have already commenced to confirm the viability of the proposed arrangements. Areas to be examined include process acceleration across a range of high-value rotables, improved strip-to-work ratios for on-aircraft maintenance, integrated software support, joint fleet management, more rapid modification embodiment, and faster provision of technical information and other post-design services.

## Future Strategies

It is clear that future military aviation maintenance support strategies will be determined largely by their impact on operational output and cost of ownership. Although it is really too early to claim a significant success for the partnering concept, it is difficult to see an alternative in delivering the necessary efficiencies and end-to-end optimization of the support chain. Contractors are likely, therefore, to undertake an increasing proportion of logistic activities, both at home and abroad. This raises the obvious question of what maintenance responsibilities will remain with the military.

## Military Maintenance

Operational maintenance will certainly continue to be performed by military logisticians, as will direct support to the front line. It is possible that these activities will be performed under joint or even coalition arrangements, but they will be undertaken by warfighters. Intermediate- and depot-level maintenance will increasingly be consolidated into a single activity, but it is not clear to what extent the government will continue to own the relevant facilities. That said, there is risk in simply allowing the competitive process to determine the outcome. It is not unreasonable to suggest that, unless the government is able to bring some organic MRO capability to the partnering process, the partnership will not prosper.

All of this tends to suggest that the military logistic organization will continue to embrace depot-level activities, particularly where legacy systems are involved or where strategic concerns remain extant. It is also arguable that 3<sup>d</sup> Line is inherently better placed to undertake the growing number of life-extension and

*Although it is really too early to claim a significant success for the partnering concept, it is difficult to see an alternative in delivering the necessary efficiencies and end-to-end optimization of the support chain.*

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## Maintenance Support Strategies

*As one commentator has observed, “Trust is the currency that makes the supply chain work. If it’s not there, the supply chain falls apart.”*

upgrade programmes. Whatever specific arrangements emerge, these activities will form one element in an integrated, responsive, and agile support chain focussed on delivering the highest level of operational output. Overall management will be exercised jointly under arrangements that partner the front-line, fleet managers, OEMs, and in-house repair agencies.

### Success Factors

Planning, contracting for outputs, the setting of priorities, and the overall integration of the support chain will properly remain the responsibility of the military customer. The emphasis will be on spares-inclusive, long-term arrangements with clear gain-share opportunities. Success will be measured by:

- Reduced inventories,
- Faster turn-round times of aircraft and rotables,
- More rapid embodiment of modifications,
- Quicker introduction of new technologies,
- Fewer *fleets within fleets*,
- Better strip-to-work ratios,
- Lower support chain costs,
- Less maintenance manpower,
- Smaller expeditionary footprint, and
- Greater operational output.

### Risks

As with any new strategy, there are risks. The fundamental building block in determining a successful partnership with industry is *trust*. As one commentator has observed, “Trust is the currency that makes the supply chain work. If it’s not there, the supply chain falls apart.”<sup>11</sup> As support chains are more closely integrated and maintenance strategies are better aligned, the more vulnerable is the logistic organization to the impact of inappropriate behaviour. In the past, the risk might have been minimized and resilience enhanced by providing duplicate or alternative in-house capabilities backed up by large inventories. This is neither affordable nor compatible with today’s operational needs. In the future, therefore, the main safeguard will be the creation of an environment in which government and industry, both primes and

subcontractors, can function coherently, effectively, and harmoniously.

## Maintenance Support Strategies

### Conclusions

Geostrategic, economic, and technological changes will make support of air operations, both at home and overseas, increasingly dependent on the flexibility and responsiveness of the military logistic organization. This requires the creation of a highly integrated and agile support chain with global reach. The most promising strategy to achieve these aims is based on a joint management approach, teaming the public and private sectors, under long-term partnering arrangements. While it is probable that organic military maintenance capabilities will be retained, particularly to address life-extension and fleet-upgrade requirements, the alliance partners will largely determine the size and shape of the military logistic organization as part of their wider responsibilities for shaping the overall support chain. Success will be measured by a reduction in inventories, faster turn-round times, more rapid modification embodiment, swifter deployment of new technologies, a smaller expeditionary footprint, lower support costs, and greater operational output.

This strategy requires more, however, than the application of just-in-time principles. It embraces commercial express transportation; innovative contracting arrangements including spares-inclusive packages; the application of commercial IT solutions to support materiel planning and inventory management; collective decision making involving all stake-holders; an overriding emphasis on operational output; and most important, a high level of trust between all the parties. These changes may well result in smaller organic military repair facilities and the greater use of contractors at all maintenance levels, including overseas. Most important, it will require the military aviation maintenance organization to move away from an internal focus on efficiency and utilization to a holistic approach that puts customer needs, in the form of operational output, first and foremost.

As the SDR concluded, "The military effectiveness of modern armed forces depends more than ever on the

*While it is probable that organic military maintenance capabilities will be retained, particularly to address life-extension and fleet-upgrade requirements, the alliance partners will largely determine the size and shape of the military logistic organization as part of their wider responsibilities for shaping the overall support chain.*

quality of their logistic and other support arrangements, where necessary adopting modern methods and best practice.”<sup>12</sup>

#### Notes

1. *The Strategic Defence Review—Supporting Essays*, Stationary Office, London, 1998.
2. The Lean Aircraft Initiative, sponsored by the USAF, seeks to half cycle times and costs of future weapons systems while greatly improving performance. *AW&ST*, 3 Jun 96 and 28 Jul 97.
3. Lt Gen William P Hallin, “The Challenge of Sustaining Older Aircraft,” *Air Force Journal of Logistics*, Vol XXII, Summer 1998, 1-2.
4. NATO Report, *Modifying Defence Equipment*, Stationary Office, 1998.
5. It should be noted that these figures represent operating costs and not budgetary responsibilities.
6. The USAF Lean Logistics initiative has successfully applied similar techniques to reduce component turn-round times, notably in the avionic and propulsion areas.
7. The Supply Excellence Programme (SEP), which has been developed from a variety of quality management models and industry standards (such as the Baldrige and European Foundation for Quality Management Models), seeks to enhance the business performance of BAE Systems’ supplier base through the employment of a business excellence-based assessment, statistical process control, and improvement tools and techniques. Some 75 percent of suppliers, by bought-out value, participate in the SEP.
8. Two-Level Maintenance (TLM) and the associated Lean Logistics initiative have reduced the average repair cycle times for typical avionics line replaceable units from 17 to 9 days. *Overhaul & Maintenance*, Jan 97, 55-57. The application of TLM principles and associated efforts have reduced the outload requirement to support a squadron of F-22 aircraft by two-thirds compared to the F-15, “Unlikely Partners: Two-Level Logistics and the Air Force Gold Programme,” *Air Force Journal of Logistics*, Vol XX, Spring 1996, 1-4.
9. This compares, however, to the 90 percent performed in house in the 1970s, *AW&ST*, 30 Aug 99.
10. Col S. J. Zamparelli, “Contractors on the Battlefield,” *Air Force Journal of Logistics*, Vol XXIII, Fall 1999, 8-17.
11. *AW&ST*, 13 Sep 99, 75-82.
12. SDR Defence White Paper, 1998, 209.

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## Notable Quotes

*Good logistics is combat power.*

**Lt Gen William G. Pagonis, USA**

*We're looking to the business community and asking, "What are you doing? How do you achieve this 'just in time' instead of 'just in case' so we can eliminate some of these storehouses that we have, these warehouses stacked with equipment that may never be used." We want to have the kind of system where we can get something that's needed to the field just in time—the right place, the right time, and the right equipment. We're doing that.*

**William S. Cohen, Secretary of Defense**

*Vulnerability lies in the equipment chain, from manufacturing to employment, and other similarly interdependent systems such as fuel and pilot training . . . logistics might well be considered the real center of gravity.*

**Air Commodore Peter Dye, RAF**

*Every unit that is not supported is a defeated unit.*

**Marshal General of France Hermann Maurice de Saxe**


*From a logistician's standpoint, the military is a structure that depends both on flexibility and on rigidity. It is both loose and tight, to use contemporary management jargon.*

**Lt Gen William G. Pagonis, USA**

*The first essential condition for an army to be able to stand the strain of battle is an adequate stock of weapons, petrol, and ammunition. In fact, the battle is fought and decided by the quartermasters before the shooting begins.*

**Field Marshal Erwin Rommel**





The Government Accounting Office recently criticized the Air Force for rising aircraft operating costs—they now exceed \$16B a year. Since the Air Force expends more than 66 percent of its budget on weapons, goods, and services, any opportunities to produce savings in this segment of the budget should be pursued.

In the commercial sector, companies have significantly reduced costs through smarter purchasing and supply management practices and adoption of e-commerce and e-business strategies. One component of a much broader e-commerce or e-business strategy is the use of business-to-business (B2B) Internet reverse auctions. Many commercial firms report significant reductions in initial purchase prices by using Internet-based reverse auctions. The technique whereby vendors vie for a contract by bidding against each other online is called *buyers* or *reverse auctions* because the price moves downward.

This article discusses the applicability of B2B Internet reverse auctions for sustainment procurement and recommends a policy framework for their use in the Air Force.

## Background

The Department of Defense (DoD) recently began using reverse auctions to purchase goods, with the Navy conducting its first one on 5 May 2000. The Naval Supply Systems Command held an

# Air Force sustainment procurement

**Wing Commander Margaret Staib, RAAF**

auction for ejector seat components and saved an estimated \$1M. Another auction held at the end of June 2000 for ship-related services resulted in a savings of almost \$3M. The Army has completed four auctions, three for information technology items and one for a military-performance specification connector for the Patriot system. On 3 August 2000, the Air Combat Command (ACC) conducted





*The concept of  
reverse auctions  
is not new  
(haggling at a  
market is akin to  
reverse auctions).*

three reverse auctions for computer equipment, saving \$88K (27 percent). On 24 August, ACC followed with its fourth reverse auction for computers and saved another \$60.2K (23 percent) from the General Services Administration scheduled price. On 8 September, the Air Force Materiel Command (AFMC) purchased 25 computer monitors using a reverse auction. However, the price reduction amounted to only \$225 (1.8 percent). In this case, the three participating vendors were not manufacturers or distributors of computer equipment, and there were only two bids.

The Army is using license-free software developed by the Massachusetts Institute of Technology Media Lab, which has since been purchased by Moai and Frictionless Commerce. It is also negotiating a follow-on agreement that will attract a license fee. The Office of the Assistant Secretary of the Air Force, Acquisitions is examining the Army software and whether the Air Force can be included in future arrangements. They are currently developing policy and examining mechanisms for using reverse auctions. In the meantime, various Air Force commands are testing the Army's software.

Since there is no guidance on the types of spares suited to procurement by reverse auction, the Air Force Deputy Chief of Staff, Installations and Logistics has been tasked with developing guidelines as part of the broader initiative to use e-business strategies to increase supply chain efficiency and responsiveness to the warfighter.

## **Market Use of Reverse Auctions**

The concept of reverse auctions is not new (haggling at a market is akin to reverse auctions). B2B Internet reverse auctions started in late 1994 when Glen Meakem proposed making suppliers compete for manufacturers' orders in live, electronic auctions. Meakem set up his own business, FreeMarkets, Inc, which has a market capitalization of \$2.7B and clients such as General Motors, United Technologies, Raytheon, and Quaker Oats. These companies have saved more than 15 percent, on average, buying parts, materials, and services at FreeMarkets auctions.<sup>1</sup> Texas-based Moai Technologies has also developed a web-based platform for conducting online

auctions. Moai worked with GoCargo.com to build a custom transaction engine that would support the online auctioning of container shipping space. GoCargo.com, launched in November 1999, drew more than 250 registered shippers in its first few days of operations.<sup>2</sup>

Other companies in the online market offer products ranging from B2B platforms, web-based B2B procurement, and live exchanges to software for online auctions. The web-based transaction systems market is expected to increase to \$1.4B over the next 3 years.<sup>3</sup>

Reverse auction business and revenue models vary. Some firms charge a transaction fee for service from the buyer or suppliers, and others sell the software so organizations can run their own auctions in house.

Although many firms have been established to support B2B Internet reverse auctions, a recent reader poll conducted by *Purchasing Magazine* found that fewer than 20 percent of the buyers reported that either they or someone else in their purchasing organization had ever participated in one. Of those who had not, 53 percent said they were not likely to do so in the near future. Lack of time, lack of research, and buying from original equipment manufacturers were reasons cited for not pursuing reverse auctions.<sup>4</sup> Use of reverse auctions may be minimal among buyers, but auctions now become important due to the interactive nature of the Internet. Auctions should be considered as part of most e-commerce strategy planning efforts.<sup>5</sup>

## Utility of Reverse Auctions

B2B Internet reverse auctions are simple in concept, but many underlying complexities need to be explored to avert any unintended consequences. Market structures will affect—and be affected by—reverse auctions, particularly where the sole determinant is price. Also, the amount of information available to buyers and sellers affects markets. The Internet allows firms to participate that were previously excluded because of cost entry or lack of information. A good understanding of the characteristics and dynamics of the market where reverse auction is proposed is necessary; otherwise, buyers may unintentionally influence market structures.

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*Reverse auctions provide buyers with an opportunity to save on the initial purchase price of goods and services. Therefore, it is a tool the Air Force should consider.*

Simple B2B Internet reverse auctions are suited to commodities of standardized value, where there is competition in the marketplace, largely based on price. Examples are fuel, cargo space, and stationery items. Auctions are also useful on the seller's side, where there is surplus inventory to be moved.<sup>6</sup> "Corporations can achieve lower prices using e-procurement platforms (directly or in exchanges) in areas where there are many buyers and sellers in products or services that can be adequately specified."<sup>7</sup> However, reverse auctions become complex where other dimensions contribute to the buy decision or where collaboration with the supplier is required. Sutherland states:

Our experience suggests that claims of price reductions are often overstated, as industry structures are often very concentrated, meaning the benefits have either already been captured or are not available . . . the blanket reverse auctioning is inappropriate where there are dimensions of quality and service that are critical in the purchase decision but not easily specified.<sup>8</sup>

Reverse auctions provide buyers with an opportunity to save on the initial purchase price of goods and services. Therefore, it is a tool the Air Force should consider.

The seller can also realize reductions in sales costs, commissions, and administrative overheads.<sup>9</sup> A further benefit for the vendor is easier access to bids via the Internet. Small businesses can now easily access requests for quotations (RFQ) on the Internet. However, purchasing lead times for complex items such as aviation spares may not be significantly reduced because of the time required to prepare a detailed RFQ.

However, when using reverse auctions, integrity of the auction needs to be maintained. Issues such as vendor collusion, buyers' supplying inaccurate information or dummy bids, and the rules for awarding a contract need to be considered. Careful screening of market participants will aid in maintaining the integrity of the auction.

Reverse auctions also can be used as the initial step in striking a strategic relationship. An auction can be run to establish pricing and select the preferred supplier. A multiyear agreement might then ensue, allowing both parties to achieve other mutual benefits through a strategic alliance. The Air Force might consider this approach to

developing corporate contracts, which would reduce transaction costs and reduce purchasing lead times.

Air Force  
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Procurement

**Value of B2B Internet Reverse Auctions in E-Business Strategies**

The value added by reverse auctions changes depending on the primary basis of competition for the items being sourced. Where price is the prime factor, the value added is higher because savings on price can be significant. Where other factors such as quality or technical complexity are paramount, the value added is less because cost reductions are achieved through other techniques such as value engineering or reductions in failures through quality control programs. Where close collaboration with the supplier is required or where risk sharing is paramount, the value in reverse auctions is questionable.

*Reverse auctions also can be used as the initial step in striking a strategic relationship.*

Figure 1 examines the value that supply e-markets can provide to a company’s end product based on the category

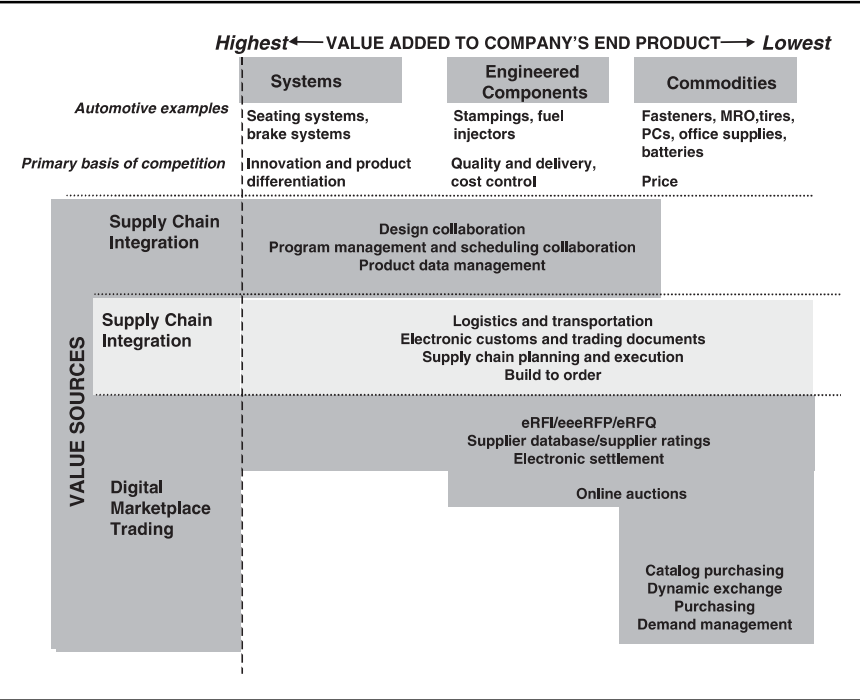


Figure 1. Supply E-Markets Can Provide a Broad Range of Value

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## Air Force Sustainment Procurement

*Reverse auctions require more than one player in the market. Dobler suggests that, when competitive bidding takes place, three to eight firms should be involved.*

of items; for example, systems, engineered components, and commodities. The model suggests that the highest level of value added for a company is derived through the much broader strategies of product development collaboration and supply chain integration. While this article does not go into discussion of other strategies, reverse auctions should not be considered in isolation from broader B2B strategies that seek to integrate supply chains from customer and supplier. More significant gains in cost reduction are achieved through collaboration and the integration of the total supply chain. The digital marketplace facilitates reverse auctions, but as Figure 1 shows, reverse auctions are but one technique available in the digital marketplace.

### Supplier Base

A goal of strategic procurement is to ensure continuity of supply. "The buyer's first responsibility in source selection is to develop and manage a viable source base."<sup>10</sup> In a marketplace where there are few players and competition is based on price, the future of organizations may become tenuous if prices are driven below the level that covers costs, particularly in the long run.

Getting caught up in the frenzy of an auction can lead sellers to underbid, even to their own detriment . . . . Thus, it is critical for companies on the sell side of auctions to understand their own economics so they can price in a way that does not bankrupt the business.<sup>11</sup>

*Federal Acquisition Regulation* (FAR) 3.501 and 15.405 advise the contracting officer to consider risks to the government in both price and contract type. In using reverse auctions, the Air Force should guard against firms that bid cost, because over time, with the aging weapon systems and reduced numbers of prime platforms, long-term assuredness of supply is critical.

Reverse auctions require more than one player in the market. Dobler suggests that, when competitive bidding takes place, three to eight firms should be involved.<sup>12</sup> Work currently being done by RAND in support of Project Air Force suggests that competition in the majority of markets for the supply of spares is low. RAND aggregated all fiscal year (FY) 1999 transactions for each contract,

segmented the spend by buying organization (for example, weapons, sustainment, and operation), and looked at how many bidders each contract had. While the figures are preliminary and currently being reviewed, the initial data show that for FY99 contract transactions, for a sustainment greater than \$25K, 63 percent of the dollar amount spent received only one bid. This represents 65 percent of contracts let. Only 16 percent of the contracts received three or more offers.<sup>13</sup> These statistics suggest that the bulk of Air Force sustainment purchases occur in markets that may not support reverse auctions. However, in these situations, the electronic marketplace might be used to solicit other, previously unknown firms.

A long-term relationship with suppliers is one of the key principles of best supply chain management practice.<sup>14</sup> However, reverse auctions may not promote long-term relationships with suppliers. The move toward e-trading fundamentally alters buyer-seller relationships. A distinct polarization is likely to develop opportunistic and trading net relationships.<sup>15</sup> Opportunistic relationships will develop where price is paramount and when the cost to switch suppliers is low (in terms of both money and goodwill), the impact on end-customer value is minimal, and cost savings can be large. Trading net partnerships will represent the close supplier-customer relationships typical of supply chain management but will use the B2B construct (the electronic coupling of supply chains) to minimize costs and increase the real-time exchange of information.

Another aspect of the supplier base of concern to the Air Force is support to small and disadvantaged businesses. B2B Internet reverse auctions do not preclude such firms from competing, and they can increase their access to government work through easier access to government tenders. However, Internet access is required, and the lead time to contact and prequalify may extend the time to tender.

## Risk

Buyers of military aviation spares also have to consider flight safety, configuration management, and total ownership costs. Aviation spare parts must meet the

*A long-term relationship with suppliers is one of the key principles of best supply chain management practice. However, reverse auctions may not promote long-term relationships with suppliers.*

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## Air Force Sustainment Procurement

*When using reverse auctions, buyers need to ensure they are dealing with qualified suppliers who will comply with the technical specifications. If price alone is driving the decision, the risk of introducing noncompliant spares into the inventory could be significantly increased.*

specifications. This requires careful screening of suppliers to mitigate against the risk of unairworthy parts. FreeMarkets does this by surveying company finances and using extensive questionnaires, the International Organization for Standardization, or other quality ratings.<sup>16</sup> When using reverse auctions, buyers need to ensure they are dealing with qualified suppliers who will comply with the technical specifications. If price alone is driving the decision, the risk of introducing noncompliant spares into the inventory could be significantly increased. Thorough screening of suppliers prior to the auction (including quality compliance and economic evaluation) would mitigate against the risk of failure. Total ownership costs could also be affected where suppliers are forced from the market, allowing the remaining players to increase prices.

### **Technical Complexity**

Significant preparatory work is required for reverse auctions, particularly for technically complex items. The requirement in the RFQ needs to be specified carefully to ensure buyers can compare values.

Specifications and technical drawings need to be made available to bidders in sufficient time for adequate evaluation. Administrative lead times will be reduced when technical drawings can be posted on the web from an Air Force perspective. The Air Force Mission Area Directorate for Information Dominance is fielding the Technical Data Solution (TeDS), a system that will allow technical drawings to be posted on the web. TeDS has the appropriate security facilities to protect proprietary data.

### **Cost of Procurement**

Air Force internal procedures for micropurchases promotes the use of the Government-wide Purchase Card (more commonly referred to as IMPAC [International Merchants Purchase Authorization Card]) for purchases less than \$2.5K. This limit is extended to \$25K where items are already on an approved contract and approval has been obtained from the contracting officer. IMPAC reduces the cost of individual transactions, but if the buys are combined for a single purchase through a medium such

as reverse auctions, the reduction in price may be more beneficial. Further, data on the type of items and frequency of buys needs to be collected to assess whether these items would be better purchased via B2B Internet auctions. In the early stages of implementing Air Force reverse auctions, however, items subject to IMPAC purchasing might be excluded until such an analysis could be conducted.

## **Multifactor B2B Internet Reverse Auctions**

The discussion in the preceding paragraphs has been confined to reverse auctions that are conducted using price as the deciding factor. Because many purchasing decisions are more complex than this, e-auction technology is moving forward to accommodate the real-life aspects of procurement decision making. E Breviate has developed software that allows buyers to conduct e-auctions with multiple parameters being evaluated simultaneously.<sup>17</sup> Numeric values are given to parameters of the total cost equation so buyers are making awards based on total cost rather than lowest price. The software also accommodates the cost of switching suppliers. Further, FreeMarkets has introduced aspects into its software that allow the normalization of bids. A simple example is the ability to receive bids in different currencies while software converts the figure into dollars.<sup>18</sup> E-auction rules can be adapted to many market situations. This advance in technology only serves to complicate the decision regarding the use of reverse auctions, because now several previously separate markets can be trading in the same marketplaces with removal of barriers through the use of easily obtained information.

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## **Proposed Air Force Criteria for Reverse Auctions**

Industry is still learning about reverse auctions, and buyers need to have a good understanding of the consequences the technique could have on a market. The preceding paragraphs suggest that, in the first instance, reverse auctions are appropriate where price is the prime criterion for award of contracts, the value of the purchase warrants



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Air Force  
Sustainment  
Procurement

*The best return to the Air Force from using reverse auctions may result from consolidation of purchasing, but it may also have ramifications for the organizational construct for purchasing in the Air Force.*

the cost of reverse auctions, and there are at least three vendors in the market. Buyers should also ensure reverse auctions do not escalate whole-of-life costs or compromise continuity of supply in the long term, other strategic partnering strategies, flight safety, or configuration management. To facilitate the Air Force evaluation of reverse auctions in sustainment procurement, a phased approach may be practical.

Phase I would be an initial examination of B2B Internet reverse auctions by the Air Force for spares using the best available software. (Later use of the software would be subject to further negotiation among the Secretary of the Air Force, Acquisitions; the Army; and the software vendor.) This phase would test the concept through actual reverse auctions, while minimizing the risk to the Air Force. Candidates would be selected from the 16 percent of purchases for spares where there were more than two bids. Items would then be examined to determine if they meet the following criteria:

- Source selection is based on *lowest price technically acceptable* (no quality, safety, or through-life costs that impact the buy decision).
- Item is not subject to IMPAC purchase requirement.
- Market has at least three vendors based on previous spend analysis.
- Specification is fixed and not likely to change.
- Reverse auctions will provide the best value for money in the long run (FAR 3.501 and 15.405 considerations).

Using the criteria suggested for Phase I, the FY99 data for purchases greater than \$25K and where there were three or more bids registered, possible candidate Federal Stock Classes (FSC) have been identified. Table 1 lists those candidates and the range of bids received, FY99 dollar amount spent in that FSC, and total number of contracts raised. The information was sourced from the RAND extract of the DD250 database that records purchases greater than \$25K.

Phase II, which could be conducted parallel with Phase I, would use B2B Internet reverse auctions to identify a potential supplier for corporate contracts and set prices. The criteria for identifying candidates in Phase II would

be the same as that used for Phase I. In addition, an assessment of the level of activity for a given item would determine which items would yield a higher payback from being incorporated into corporate contracts. Thus, the benefit to the Air Force would be reductions in price, transactional costs, and procurement lead times. Possible candidates for Phase II are listed in Table 2. The candidates show a high level of activity, which may suggest corporate contracts would reduce administrative lead times and transactional costs.

Phase III would develop a multifactor model that suits the Air Force for the purchase of more complex buying through e-auctions. This phase could also be conducted in parallel with Phase I and II but should take into account lessons learned from the trial of reverse auctions. Criteria for items subject to a multifactor model would not be confined to those listed above. Rather, any item where there are more than two suppliers should be considered. This phase may also require a technology partner.

Each phase requires careful evaluation for lessons learned, with procedures being documented.

While the training and education required for Air Force buyers to use B2B Internet reverse auctions has not been discussed, this aspect should not be underestimated, particularly in the wider context of a more strategic approach to purchasing and supply management. The best return to the Air Force from using reverse auctions may result from consolidation of purchasing, but it may also have ramifications for the organizational construct for purchasing in the Air Force.

Throughout this approach, B2B Internet reverse auctions should be examined as part of the comprehensive development of B2B marketplace strategies.

## Opportunities for Further Research

Because B2B Internet reverse auctions are still a relatively new strategy, the total costs associated with them have not been examined, particularly in relation to the long-term impact on markets and future supply. The DoD examples cited are ones where the savings for future buys for the same items would be useful for comparing first-time results and determining whether savings can be made in a second round of reverse auctions.

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Air Force  
Sustainment  
Procurement

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percent.*

This review examined the data RAND extracted from the DD250 database that records only purchases greater than \$25K. It may be useful to study IMPAC activity and other purchases less than \$25K for possible consolidation of purchasing activity using a B2B Internet reverse auction medium.

Reverse auctions should also be considered in the broader context of best purchasing and supply management practice as described in the RAND paper.<sup>19</sup>

**Conclusion**

Reverse auctions can achieve savings on the initial purchase price of spares, with some commercial firms reporting an average of 15 percent. The Air Force has already tested reverse auctions for computer hardware with identified savings on initial price. The practice works well where price-oriented decisions are paramount; however, reverse auctions tend to promote short-term relationships with vendors. Reverse auctions may also

FSC	FSC NAME	#Bids	#Contracts	\$ FY99
2520	Vehicular power transmission components	4	1	233,260
2815	Diesel engines and components	3-5	2	317,146
4320	Power and hand pumps	3-6	9	2,004,957
4510	Plumbing fixtures and accessories	4-6	3	2,401,635
4710	Pipe and tube	3-4	2	192,581
4930	Lubrication and fuel-dispensing equipment	8	1	1,943,896
5110	Handtools, edged, nonpowered	3	1	140,151
5120	Handtools, nonedged, nonpowered	3-8	5	521,659
5820	Radio and TV communications equipment except airborne	4	1	427,980
5945	Relays and solenoids	9	1	31,930
5999	Miscellaneous electrical and electronic components	3-7	3	13,578,592
6115	Generators, generator sets, electrical	7	1	934,480
6220	Electric vehicular lights and fixtures	4-5	2	74,003
6225	Electrical and electronic measuring and test instruments	3-6	6	1,937,654
6680	Flow, level, motion-measuring instruments	3-9	6	309,054

**Table 1. Possible FSC Candidates for Reverse Auctions Phase I**

FSC	FSC NAME	#Bids	#Contracts	\$ FY99
4920	Aircraft maintenance and repair shop specialized equipment	3-10	23	10,082,342
1560	Airframe structural components	3-14	42	36,686,680
2840	Gas turbines and jet engines, aircraft % comps	3-9	80	506,631,217
9135	Liquid propellant fuels, chemical base	3-7	38	26,747,651

**Table 2. Possible FSC Candidates for Reverse Auctions Phase II**

distort market behavior, leading to changes in the dynamics of the marketplace. Where the objective is to develop closer relationships with nominated suppliers in pursuit of supply chain management objectives (such as collaborative planning and information exchange) or where other criteria are used for source selection (such as quality or configuration management), auctioning may not be appropriate. Further, where continuity of supply is threatened by price competition, forcing too many players from the market, reverse auctions provide only a short-term gain and may significantly compromise longer term availability.

With more than 65 percent of Air Force sustainment spares contracts in FY99 receiving only one bid, a significant portion of sustainment procurement does not meet the necessary condition for reverse auctions of more than one supplier. However, approximately 16 percent of the FY99 contracts had more than two bidders, so there is opportunity in this segment to examine whether items meet the other criteria for reverse auctions. This segment has been reviewed, and possible candidates have been identified. While the discussion has focused on buying situations where price is the determining factor, developments in e-auction technologies (software and process) mean multifactor e-auctions are also possible.

*Approximately 16 percent of the FY99 contracts had more than two bidders, so there is opportunity in this segment to examine whether items meet the other criteria for reverse auctions.*

## Recommendations

- While simple in concept, B2B Internet reverse auctions can fundamentally change the dynamics of the market; therefore, care should be used in the decision to employ the technique. B2B Internet reverse auctions are but one tool in a broader B2B strategy that the Air Force is developing.
- Use proposed framework and phased approach for selecting reverse auction candidates.
- The Deputy Chief of Staff, Installations and Logistics and the Air Force Materiel Command review the proposed candidates for trials of reverse auctions.

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## Notable Quotes

*Strange as it may seem, the Air Force, except in the air, is the least mobile of all the Services. A squadron can reach its destination in a few hours, but its establishment, depots, fuel, spare parts, and workshops take many weeks, and even months, to develop.*

**Winston Churchill**

*Logistics is traditionally an unglamorous and underappreciated activity. To generalize, when the battle is going well, the strategist and tactician are lionized; it is only when the tanks run out of gas that people go head-hunting for the logisticians.*

**Lt Gen William G. Pagonis, USA**

*The plan was smooth on paper, only they forgot the ravines.*

**Russian Military Proverb**

*The intensity of that war serves to underline the need for holding large stocks of expensive war materials if one is contemplating war or intending to deter a potential aggressor. Such stocks offer little appeal to most politicians with their eyes on the electorate; nor to those who wish to cut defense spending for moral or economic reasons, or, indeed, to those who wish to be seen to have their country's defense interests at heart, by building up the shop-window with men and equipment. All too often, that shop window has pitifully small stocks of war reserves behind it, simply because to cut back on the holdings of war reserves represents an easy and invisible path to economy. Yet, to deter, stocks need not only to exist but be seen to exist.*

**—Major General Julian Thompson,  
Royal Marines**



**We, as an institution, are allowing individuality (perhaps with morale in mind) to slowly erode our sense of mission and esprit de corps.**

# **Force Support**

## **for the expeditionary air force**

Of the 363,724 officer and enlisted members in the Air Force in January 1999, only 39,982 were in flying specialty codes—just under 11 percent of the total force. Our leadership challenge, then, is to ensure the remaining 89 percent of the Air Force fully understand how important they are to the mission. Even more important, we must all understand how we mesh the 11 percent and 89 percent together to accomplish the mission.

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**Captain Ronald N. Dains, USAF**

**A**ttend any professional sports event, and you will find fans wearing the names of their favorite team members on T-shirts, sweatshirts, and possibly tattooed onto their skin. Normally, the names are of football quarterbacks or running backs, baseball pitchers or home-run hitters, or the most current basketball phenom. Very seldom does one see names of second-string punters or centers, guys with low batting averages, or the basketball guard who was traded for the fourth time in the current season. You do not see enthusiastic fans sporting the name of the team's equipment manager, bus driver, or stadium janitor on a garment either. This is part of our American heritage, which holds that we associate achievement with a *hero* or *winner*. In the movie *Patton*,<sup>2</sup> George C. Scott eloquently reenacted General Patton's address to the Third Army. In this address, he elicited a surge of patriotism and *can do* spirit by stating, "Americans love a winner. Americans will not tolerate a loser."<sup>3</sup> He drew on the power of positive association. Unfortunately, the things or people we associate with often hold little



## Force Support for the Expeditionary Air Force



*How do we, as Air Force leaders, motivate our people (especially those in support functions) to value their role on the larger Air Force team while allowing the power of association to remain as a normal, healthy organizational behavior?*

regard for the sacrifices made by so many people behind the scenes. This psyche pervades our Air Force today. While healthy in most respects and, indeed, critical to creating a *winning* team, it may be detrimental in the long run if people lose sight of their roles and responsibilities by focusing their efforts on proving their worth solely through methods of association.

Visit an Air Force base today, and you will see Air Force members in a green, gray, or blue flight suit, depending on their function as flight crew or space and missile operations. Some military members may also wear polo shirts or wind suits with embroidered logos specific to their organization. Nonsurgical personnel may be wearing scrubs at clinics and hospitals. You may sense that people, in general, have an aversion to being found in blues or, heaven forbid, battle dress uniform (BDU). This is not to question the validity or functional necessity of the clothing. Rather it questions the rationale commanders, managers, and policy makers use to justify the need and expenditures to provide these special items. Are we focusing too much on the seemingly pervasive need to associate with *winners* (read those in *flying career fields*) and thereby foregoing association with the larger Air Force team? Or are we maintaining a clear view of the Air Force mission, membership in the profession of arms, and merely attempting to boost morale?

We, as an institution, are allowing individuality (perhaps with morale in mind) to slowly erode our sense of mission and esprit de corps. How do we, as Air Force leaders, motivate our people (especially those in support functions) to value their role on the larger Air Force team while allowing the power of association to remain as a normal, healthy organizational behavior? The sheer numbers of people in the nonflying career fields should make this leadership challenge relatively easy. Of the 363,724 officer and enlisted members in the Air Force in January 1999, only 39,982 were in flying specialty codes—just under 11 percent of the total force.<sup>4</sup> Our leadership challenge, then, is to ensure the remaining 89 percent of the Air Force fully understand how important they are to the mission. Even more important, we must all

understand how we mesh the 11 percent and 89 percent together to accomplish the mission.

Fortunately, we have a ready-made teaching tool in the core competencies as outlined in Air Force Doctrine Document 1 (AFDD-1). With the answers so readily available, it only remains that we must teach our people and change the culture of today's Air Force and continuously demonstrate how vital support (logistics) and other functions are to accomplishing the Air Force mission. This article serves three purposes: (1) emphasize the critical role logistics plays in mission accomplishment, (2) caution all members that taking logistical support for granted (with the view of improving operational capability) may adversely impact readiness and capability, and (3) solicit senior leadership to place emphasis on logistics as an Air and Space Power function.

## **Air Force Basic Doctrine**

For many leaders, especially those who have been around the Air Force since just prior to Desert Storm, mere mention of AFDD-1 brings back chilling memories of the days when Air Force Manual 1-1 (AFM 1-1) came out. General Merrill A. McPeak, then Chief of Staff of the Air Force, decreed that he expected officers and senior enlisted members to know AFM 1-1, Volume I, and at least be conversant with Volume II. It is probably a safe bet that there are thousands of editions still in shrink-wrap or, at best, filling those pesky 2-inch gaps in many professional libraries. Perhaps by realizing that AFM 1-1 was a flight surgeon's best cure for insomnia, Air Force leadership decided something must be done to get people interested in doctrine. Being a problem-solving or image conscious service, we decided to create doctrine documents with pictures, graphs, and bolded items and package them in neat-looking manuals. To further ensure people would accept and read these manuals, they were printed in booklet form perfectly sized for the lower leg pocket on a flight suit or a thigh pocket on a BDU. It was a great start, but what has happened? People still wonder what it is they are doing and how they fit in. Very often the answer to questions on this matter elicits a condescending, "You do not have the big picture." It is

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## Force Support for the Expeditionary Air Force

*We, as leaders, do a poor job outside classroom settings of emphasizing the importance of every Air Force member knowing basic doctrine.*

quite possible people answering the questions recite this colloquialism because of their own inability to understand the Air Force mission. Why? Perhaps they may not realize that the *big picture* is found in a small document—AFDD-1, *Air Force Basic Doctrine*. More important, we, as leaders, do a poor job outside classroom settings of emphasizing the importance of every Air Force member knowing basic doctrine. With the expeditionary Air Force just over the horizon and uncertain future threats, it becomes more critical that all Air Force people—active, reserve, and civilians—especially support personnel, understand our doctrine or our *raison d'être*.

## Core Competencies Versus Air and Space Power Functions

Perhaps an overarching problem with the seemingly *taken for granted* view of force support lies in AFDD-1 itself. The core competencies of Air and Space Superiority, Precision Engagement, Information Superiority, Global Attack, and Rapid Global Mobility<sup>5</sup> are readily supported—or further refined—by 1 or more of the 17 Air and Space Power functions. These functions are counterair, counterspace, counterland, countersea, strategic attack, counterinformation, command and control, airlift, air refueling, spacelift, special operations employment, intelligence, surveillance, reconnaissance, combat search and rescue, navigation and positioning, and weather services.<sup>6</sup> To a casual observer, nothing may seem to be missing. After all, is not the Air Force only about airplanes, bombs, and satellites? These functions represent an *end product* for the Air Force. If you know your doctrine, you should have noticed that in the above list of core competencies, Agile Combat Support was omitted. The omission was made because in AFDD-1 there is no further refinement or support for this competency in the list of Air and Space Power functions. Is logistics not included as an Air and Space Power function because it is too broad a topic to grasp? Or could it be that it does not necessarily involve aircraft and, therefore, does not require *winged* operators; hence, it should not be an Air and Space Power function? Or is Agile Combat Support listed as a core competency merely

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to throw a *bone* and placate the support fields? All these are true. For this reason, our Air Force leaders must facilitate increased understanding of logistics and institutionalize logistics (Agile Combat Support) as a warfighting skill, especially in this era of the expeditionary aerospace force.

## **Logistics Defined and Understood in Context of Joint Publication 4-0**

When Paul G. Kaminski, Under Secretary of Defense for Acquisition and Technology, addressed the 12<sup>th</sup> National Logistics Symposium and Exhibition in October of 1995, he stated, “[he] found the subject of logistics is of growing interest to our warfighters.”<sup>7</sup> What did he mean by *warfighters*? Is the logistician any less a warfighter than the pilot, infantryman, or tanker? Do logisticians just punch the clock and work *normal* office hours? Hardly! Had Mr Kaminski read the definition of logistics in AFDD-1, he might have reconsidered his term *warfighter* and perhaps recognized the fact logistics *is* an *operational* (warfighting) art. The definition in AFDD-1 (taken from Joint Publication 1-02) follows:

The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of *military operations* that deal with: a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of material; b. movement, evacuation, and hospitalization of personnel; c. acquisition or construction, maintenance, *operation*, and disposition of facilities; and d. acquisition or furnishing of services.<sup>8</sup> [Emphasis added.]

Mr Kaminski came close to calling logisticians *warfighters* when he spoke of the logistics role of Desert Shield/Desert Storm. He quoted John Chancellor of NBC news as saying, “This was a logistician’s war. Logistics, the movement of troops and supplies, made all the difference.”<sup>9</sup> Mr Chancellor’s comments should not have come as a surprise. In the executive summary of Joint Publication 4-0, the notes of emphasis (in the margin) state, “Logistics is the foundation of combat power.”<sup>10</sup> The supporting text states, “Logistics is the bridge connecting a nation’s economy to a nation’s warfighting

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## Force Support for the Expeditionary Air Force

*Our task is to marry the concept of logistics as outlined in Joint Publication 4-0 with the Agile Combat Support competency found in AFDD-1. In order to do so, we should understand some of the historical lessons learned concerning logistics and realize there are a myriad of challenges in our future.*

forces.”<sup>11</sup> How important was logistics to our success in the Gulf War? Some interesting statistics help paint the picture.

The Air Force alone used fifteen million gallons of jet fuel *a day* [Emphasis in original] at the height of the war . . . . Storing, transporting, and issuing this fuel remained a significant obstacle that was surmounted by a combination of new pipelines and the Air Force’s supply of fuel bladders, hydrant systems, refueling vehicles, and trained personnel gathered from all over the United States, Europe, and the Pacific. To meet this requirement, however, the Air Force deployed *92 percent of its entire refueling assets to the theater*. [Emphasis added] . . . . [They] had also deployed to the gulf 85 percent of all . . . equipment for operating from bare bases—tents, dining facilities, and so forth . . . [52 percent of the Air Force’s HARMs (high-speed antiradiation missile), 63 percent of its LGBs (laser-guided bomb), 63 percent of its Mavericks, and 43 percent of its CBU’s (cluster bomb unit) were deployed into theater.]<sup>12</sup>

This equipment movement was planned, coordinated, and executed by logisticians. Whether or not people in the logistics functions of supply, maintenance, transportation, general engineering, and health services<sup>13</sup> are seen as warfighters, it should be readily evident that without the logistics capability they provide, our Air Force will be unable to fulfill its role in joint operations. Our task, then, is to marry the concept of logistics as outlined in Joint Publication 4-0 with the Agile Combat Support competency found in AFDD-1. In order to do so, we should understand some of the historical *lessons learned* concerning logistics and realize there are a myriad of challenges in our future. These challenges can be overcome if we ensure all logisticians know and understand their roles and responsibilities as set forth in doctrine.

## Logistics Lessons Learned

The maxim that *failing to learn history dooms one to repeat the same mistakes* is probably the most overused, yet underpracticed, statement in the military. Many leaders, when pontificating or postulating on a given subject, will spout those words and then set policy based almost solely on current information and political

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restrictions. The Department of Defense (DoD) civilian leadership and elected officials are supposedly taking the advice and counsel of our general officers, who should be getting well-researched advice from their staffs. It is quite probable this is happening, but these same people are also being inundated with information and requests from special interest groups who are looking out for their pocketbooks rather than our national security. In the area of logistics, history has proven time and again that we continue to make costly mistakes when we fail to learn from history.

In his article “Logistics: The Past is Prologue,” Deputy Assistant Secretary of the Army for Logistics Eric A. Orsini says:

In the plethora of initiatives on efficiencies, some favorite buzzwords are two-level maintenance, outsourcing to original manufacturers, and just-in-time inventory. The judgment is that the infrastructure is bloated, systems are archaic and we are living in the past. These charges are not coming from battle-hardened commanders but from industry representatives, think tanks, and academia.<sup>14</sup>

He cites as historical precedence the case of the German military in the 1940s. Panzer divisions operated under the concept of two-level maintenance and just-in-time inventory. Damaged tanks that could not be repaired in the field were sent back to the factory. The logistics concept worked well in the campaign in Poland in 1939 and subsequent campaign in France in 1940, but both were fairly short campaigns. The Germans declared the two-level concept a success and implemented the plan. Unfortunately, this concept was to work against them in Russia. Poor planning (possibly by taking their capability for granted), increased losses due to mines and attack, high attrition rates due to distance and extreme climatic conditions, and a poor logistics infrastructure made the two-level system impractical. The fix did not come until 1942, and then it did little good because of other blunders. The Tiger tank failed because of rushed production and employment without adequate supplies of spare parts. The same thing happened with mass production of the Panther tank. The Germans sent 325 Panther tanks into battle and then found defects in the steering and control mechanisms.

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## Force Support for the Expeditionary Air Force

*It is difficult to put much stock in a logistics system whose success has been promised without testing in the worst possible cases or scenarios.*

They all had to go back to the factory. To make matters worse, once the initial problem was fixed, the engines were found to be inadequate.<sup>15</sup> Lesson learned: you cannot shortchange any part of the logistics chain and hope to be successful in battle. But has senior leadership learned this lesson?

To answer this question, consider the following excerpt from *Focused Logistics* concerning the concept of agile infrastructure.<sup>16</sup>

[Agile infrastructure] will result in the *right sizing* of the logistics footprint through reductions in logistics forces, facilities, equipment and supplies. These reductions will be enabled through significant enhancements to joint logistics policies, structures and processes in inventory management, engineering, maintenance, and infrastructure improvements.

It is difficult to put much stock in a logistics system whose success has been promised without testing in the worst possible cases or scenarios. Are we making changes to our future logistics capability based on relatively short campaigns, as the Germans did earlier this century? The Gulf War may have been won in 6 weeks, but we had nearly 6 months to prepare. The recent Kosovo air campaign was, perhaps, easier logistically but lasted even longer—78 days. Granted, there were gross inefficiencies in the way we handled the logistics chain in both scenarios. However, much of that was due to our own dealings with the *fog* and *friction* of war—better to have too much of what you do not need than to have none of what you must have. Is this only true in modern warfare? Not at all!

In *For Want of a Nail*,<sup>17</sup> Kenneth Macksey cites Benjamin Franklin's maxim:

For want of a nail, the shoe was lost—  
For want of a shoe, the horse was lost—  
For want of a horse, the rider was lost—  
For want of a rider, the battle was lost.

This, along with 13 chapters of text replete with examples of the effects of logistics on war from the early 1800s to 1975, serves as warning that we must not “overlook the workings of what may be termed the *logistic equaliser*.”<sup>18</sup> He cites Britain's failure to maintain her logistical capabilities gained during the Napoleonic wars

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as an example of allowing economic policies to subjugate military power. “Whenever military organisations come under financial constraints, they tend to make disproportionate economies in the logistic services compared to the combat arms.”<sup>19</sup>

The case is easily made that we are following historical precedence and putting money into force modernization at the expense of logistical capability. Outsourcing and privatization is an example. “The Commission on Roles and Missions of the Armed Forces in 1995 encouraged the DoD to pursue outsourcing and privatization to generate savings that could be applied to force modernization.”<sup>20</sup> The operative word in that quote is *could*. Hardly a contractual statement to make the logisticians of the world sleep better at night.

Given that the historical lessons and current policies regarding infrastructure paint a less than perfect picture for the logistics community, how will we motivate our people to meet the challenge? It all goes back to understanding our role in doctrine.

## **Maintaining Doctrinal Focus in the Expeditionary Air Force**

Logistics is traditionally an unglamorous and unappreciated activity. To generalize, when the battle is going well, the strategist and tactician are lionized; it is only when the tanks run out of gas that people go head-hunting for the logistician.<sup>21</sup>

Regardless of historical lessons, the fact remains that we are in a changing military environment for economic, political, tactical, and strategic reasons. We can and will make changes to our doctrine documents as the need arises. What we must not do is make arbitrary decisions to disassociate ourselves from our role in doctrine simply because we gain more attention for ourselves—or our particular career fields—through association with other career fields that may be in the limelight. A firm understanding and complete acceptance of our role in doctrine will go far in making every member proud to be associated with the Air Force, regardless of career field. Teaching and demonstrating the importance of doctrine to our newest members may help turn the tide in this era

## **Force Support for the Expeditionary Air Force**

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association with  
other career  
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limelight.*



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## Force Support for the Expeditionary Air Force

*Recognizing logistics as a warfighting skill by including it as an Air and Space Power function and educating the entire Air Force about each other's role in doctrine will go far toward ensuring our natural tendency for association remains healthy and focused on our warfighting capability.*

of individualism or association with only those seen as *heroes* or *winners*.

### A Leadership Opportunity

General Patton's speech to the Third Army, as depicted in the movie, was cited earlier. The emphasis is on our natural tendency to associate ourselves with *winners*. Many who have watched the movie may have perceived the *winners* as only those front-line troops who fought for General Patton. He did not see it that way. In the movie, an important part of his actual speech was omitted, probably since it lacked glamour.

All of the real heroes are not storybook combat fighters, either. Every single man in this Army plays a vital role. Don't ever let up. Don't ever think that your job is unimportant. Every man has a job to do, and he must do it. Every man is a vital link in the great chain . . . every man does his job. Every man serves the whole. Every department, every unit, is important in this vast scheme of war . . . Each man must not only think of himself, but also of his buddy beside him.<sup>22</sup>

With the expeditionary Air Force becoming a reality, we have a golden opportunity to heed General Patton's words concerning people's importance. Recognizing logistics as a warfighting skill by including it as an Air and Space Power function and educating the entire Air Force about each other's role in doctrine will go far toward ensuring our natural tendency for association remains healthy and focused on our warfighting capability.

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*The Air Force is committed to pursuing outsourcing and privatization initiatives across our service . . . we are stepping back and taking a broad look across our service to identify opportunities to produce a better Air Force, based on excellence in processes and performance in both combat and support areas that will provide the air and space capabilities required for the future.*

—General Ronald Fogleman

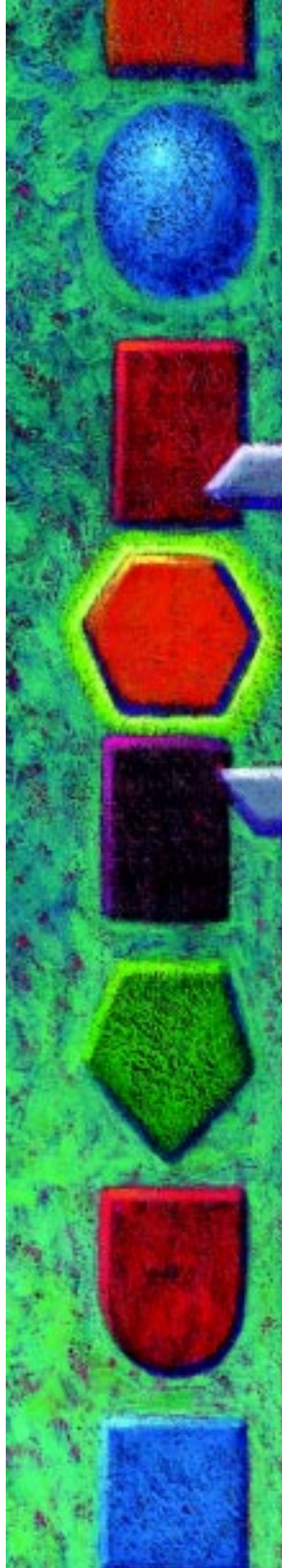
Since 1955, the Department of Defense (DoD) has been encouraged to obtain commercially available goods and services from the private sector through competitions when such action was cost-effective. However, over the years, numerous changes in law inhibited DoD outsourcing efforts. Then, in 1996, shrinking defense

## How Are We Doing?

# Base Operations Support Competitive Sourcing and Privatization

Major Kurt A. Kittl, USAF

budgets, force downsizing, and lack of procurement money for modernization led to a relaxing of some legislative restrictions, thus sparking renewed interest in outsourcing. Today, at the forefront of DoD's outsourcing revolution, the Air Force is aggressively pursuing competitive sourcing and privatization (CS&P) to free up dollars for its highest priorities, especially modernization. As defense budgets have continued their decline, the Air Force has turned to outsourced base operations support (BOS) services as a key opportunity for cost savings and improved efficiencies. Enormously diverse—both in size and complexity—the practice of consolidating or bundling separate base services into one large BOS contract has been steadily growing across the Air Force. These BOS initiatives range from continental







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*Competitive sourcing is designed to maximize cost-effectiveness and efficiency, thus enhancing mission capability, by using services available in the commercial sector, with the government retaining ownership and control of the activity.*

United States (CONUS) main operating bases to forward operating bases, air stations, and remote radar sites in the United States and foreign countries. Accordingly, many different government BOS program and contract management organizational structures have been created to oversee or manage contractor performance—some more successfully than others.

Many early BOS challenges grew out of the initial rush to outsource and lack of a comprehensive, Air Force-level strategic direction or policy to organize, educate, train, and facilitate the radical paradigm shift to commercially provided BOS services. The result has been fewer cost savings and less effective BOS management. But significant cost savings and improved BOS support to the warfighter can be achieved through careful organizational restructuring, strong investment in personnel education and training, and continuing BOS process improvements.

*Competitive sourcing* is designed to maximize cost-effectiveness and efficiency, thus enhancing mission capability, by using services available in the commercial sector, with the government retaining ownership and control of the activity. On the other hand, *privatization* is the actual transfer of control and ownership of a target business asset and associated activity from the public sector to the private sector. Here, the government gives up responsibility and control of the activity. Another essential feature of privatization is the shift to the private sector of long-term financial investment to sustain the activity.<sup>1</sup> Although most BOS services fall under competitive sourcing, other areas such as base housing and utilities and those installations affected by base realignment and closures are becoming privatized, with a host of possibilities for strategic alliances with a number of players. This article addresses only those BOS activities related to competitive sourcing.

Beginning in 1997, the Air Force established four principal CS&P goals: sustain readiness, improve performance and quality by doing business more efficiently and cost-effectively, generate funds for force modernization, and focus personnel and resources on core Air Force missions.<sup>2</sup> To achieve these ambitious goals, the expanded outsourcing of BOS services was viewed as a

key area for potential improvements and future cost savings. Since every Air Force installation has an extensive and well-developed service support infrastructure, the possibilities for outsourcing various combinations of support services are substantial. However, because the initial wave of CS&P was implemented so quickly (before clear, Air Force-level policy and detailed guidance were available), major commands (MAJCOM) and bases developed their own, often ad hoc, approaches to select activities for outsourcing. Even more problematic was the requirement to follow a cumbersome, bureaucratic, and slow A-76 process while trying to develop (often from scratch) good performance work statements (PWS), quality assurance surveillance plans (QASP), and contracts. This often resulted in an ambiguously worded, military specification/military standard (MILSPEC/MILSTD), *how to* work statement developed separately from a compliance-oriented military inspection checklist QASP, both of which were disconnected from the legally binding service contract instrument.

Fortunately, recent acquisition reforms and steady improvements in Federal, DoD, and Air Force statutory guidance and policy direction have led to overall improvements in CS&P and BOS management. Today, Performance-Based Service Acquisition (PBSA) and Business Requirements Advisory Group (BRAG) initiatives offer the promise to achieve all four CS&P goals—and most importantly—to optimize support to the warfighter. Perhaps even more promising are the many leading-edge practices and innovations coming from a growing number of Air Force BOS management organizations. Successful BOS implementation by these organizations is putting the theory into practice and helping pave the way for future BOS improvements.

## **Base Operations Support Problem Areas**

*Analyzing your present culture is like going to history class, when you could learn more valuable stuff from studying the future . . . Cultural change*

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*should be guided by where the organization needs to go, not by where it's been.*

—Price Pritchett  
High-Velocity Culture Change

*Numerous studies—including the 1993 Bottom-Up Review, Quadrennial Defense Review, Defense Reform Initiative, and National Defense Panel—have concluded that DoD could achieve the largest savings by using a single omnibus (that is, bundled, umbrella, or BOS) contract, instead of several smaller contracts, to encompass multiple BOS services.*

### **Problems in Defining and Measuring BOS**

BOS services are generally those functions necessary to support, operate, and maintain DoD installations. Although the Office of Management and Budget identified 29 different services as base support functions, neither DoD nor the military has a generally accepted definition for them. Without the framework of a common definition, it is difficult to measure the size and cost of the base support work force. Yet, there is a clear need to do so since DoD estimates that BOS activities cost more than \$30B in fiscal year (FY) 1997.<sup>3</sup>

Numerous studies—including the 1993 Bottom-Up Review, Quadrennial Defense Review, Defense Reform Initiative, and National Defense Panel—have concluded that DoD could achieve the largest savings by using a single *omnibus* (that is, bundled, umbrella, or BOS) contract, instead of several smaller contracts, to encompass multiple BOS services.<sup>4</sup> This conclusion has fueled the growing interest in BOS across DoD. In particular, the Air Force is projecting a 20-percent cost savings of \$1.26B, most of which would come from the outsourcing of BOS functions between FY98 and FY03. Based on prior outsourcing experience, projecting an average 29-percent savings, this number is conservative.<sup>5</sup> However, because no common understanding of BOS exists, attempting to compare services between contracts and installations (or even among the Services) to accurately identify what services are included or excluded is extremely difficult. For example, the Army developed the Service Base Costing methodology (reflecting spending, not budgets) to better understand where its installation support money was being spent. A subsequent cost study examined 2 years of spending data in 95 different base service areas (both contracted-out and organic) at every Army installation. Analysis of these data performed by the Institute for Defense Analysis showed,

“There was no systematic tendency for increased contracting to be associated with reduced costs.”<sup>6</sup>

In contrast, the Air Force is boasting of many successes coming out of its A-76 competitions. After 1,399 competitions in 10 years, it has claimed a cost avoidance of more than \$9B, manpower reductions of more than 37,621 full-time equivalents, and an average 38-percent cost savings (regardless of whether the work was awarded in-house or contract).<sup>7</sup> Table 1 illustrates some examples of BOS manpower savings.

Another problem in measuring cost savings (single BOS contracts for multiple base services) is the lack of a requirement to do so once a commercial activities study has been completed.<sup>9</sup> Moreover, since contracts are continually being modified and changed, the cost data from initial commercial studies quickly become obsolete. Indeed, the total costs of outsourcing are difficult to measure for other reasons as well. For example, a study by RAND found, “Because outsourcing influences management and monitoring costs, long-term investment needs, and the strategic focus of the organization, in addition to the short-term direct costs, its overall costs and benefits must be carefully evaluated.”<sup>10</sup> Nevertheless, the study also demonstrated that the development of long-term partnerships does not require more people or time than

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Base	Pre	Post	Savings	Decision
Patrick (FY98)	118	69	42% (\$2M)	In-house
Wright-Patterson (FY98)	503	254	50% (\$14M)	Contract
Vandenberg (FY98)	211	142	33% (\$3M)	Contract
Columbus (FY97)	341	227	33% (\$6M)	In-house
Tyndall (FY97)	1,034	666	36% (\$18M)	Contract
Laughlin (FY96)	278	187	33% (\$6M)	Contract
Goodfellow (FY94)	277	176	36% (\$1M)	In-house
Niagara Falls (FY90)	117	75	36% (\$2M)	Contract

Table 1. BOS A-76<sup>a</sup>



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*Without significant managerial and organizational changes, the Pentagon will have a difficult time applying the lessons it has learned in these initial competitive-sourcing experiences to large segments of its uniformed and civilian work force.*

managing large numbers of (less trusting) arms-length relationships but is likely to require a more professional and highly trained staff.<sup>11</sup>

In short, this lack of common understanding, within DoD, of what BOS is and how it can be measured and priced makes it hard to validate and justify claims of savings and generate greater support for expanded BOS outsourcing. Yet, despite these problems, a very important consideration of BOS is that each base or installation is unique in terms of its mission, infrastructure, location, and many other factors. Therefore, decisions about what activities to outsource and how to arrange the BOS service area groupings should be carefully tailored around the unique requirements of each installation and its mission. Likewise, it is essential that serious attention be directed to establishing the optimal government organization to perform program management and contract administration after the contract is awarded.

### **Recurring BOS Program Management and Contract Administration Problem Areas**

In its guide, *Best Practices for Contract Administration*, the Office of Federal Procurement Policy (OFPP) cited several weaknesses in contract administration practices. Some of these included improperly trained officials' performing contract oversight, unclear roles and responsibilities of technical representatives, unclear statements of work (SOW) that hinder contractor performance, lack of a well-defined relationship between the contracting officer (CO) and program personnel, inadequate surveillance and monitoring of contracts, and contracting officials' allocating more time to awarding contracts than administering them.<sup>12</sup> Moreover, a RAND research brief argues, "Without significant managerial and organizational changes, the Pentagon will have a difficult time applying the lessons it has learned in these initial competitive-sourcing experiences to large segments of its uniformed and civilian work force."<sup>13</sup> Indeed, these kinds of problems can often be traced back to weaknesses in how the government team was selected, organized, educated, and trained. In turn, these problems have led to poor work statements, inadequate quality assurance surveillance, and difficulties in contract administration.

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*Government Team.* There is no standard government structure to manage BOS contracts. Even so, based on the greater size, complexity, and diversity of BOS contracts, it is essential to have a well-educated, trained, and experienced team of cross-functional experts knowledgeable in commercial industry philosophies and practices. These are foundational to efficient and effective BOS management. Strong teamwork and partnering must occur both internally (one team, one goal, one voice) and externally between the government and the commercial-service provider. Unfortunately, the traditional Air Force organizational structure, culture, and functional specialization are resistant to this.

In fact, the Defense Science Board stated that one of the main impediments to outsourcing and privatization is the “resistance of the DoD culture to fundamental change.”<sup>14</sup> Influenced by the bipolar Cold War experience, military warfighter thinking has been focused on readiness and the ability to carry out successful military operations—cost-consciousness and process efficiencies have taken a backseat. To support this Cold War thinking, the military built a *stovepipe* system of functional specialization (for both officers and enlisted) that has remained largely unchanged since World War II. Hence, critical in-depth knowledge and appreciation of commercial philosophies and business practices are quite foreign to most *blue-suiters*. An article in the Air Force Logistics Management Agency’s *Issues and Strategy 2000: Contractors on the Battlefield* is especially critical in addressing the need for change:

The time has come for military officers to stop rowing against the tide and plunge into the world of privatization . . . . The uniformed military needs a vastly expanded pool of well-trained professionals . . . to be effective, these military brain trusts *must* have true expertise in real-world military operations, public sector privatization lessons learned, Federal law, and policy issues, as well as a thorough knowledge of commercial capabilities in the private sector.<sup>15</sup>

The article goes on to suggest that, instead of sending our best and brightest officers to intermediate and senior service schools, it might be better to send them to

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*A key aspect of effective BOS management lies in how the PMO is organized in terms of skills, specialties, grades, and numbers of people (military and government civilian mix).*

institutions such as the Wharton School of Business. This would be followed by internships with cutting-edge businesses whose success is centered on information management, outsourcing, and a complex web of suppliers.<sup>16</sup> The bottom line is the government team—as it is currently educated, trained, and experienced—is ill-prepared to fully capitalize on the many opportunities that exist through commercially provided BOS services. Accordingly, one of the most urgent areas requiring this commercial understanding is base-level program management and contract administration.

It must be emphasized that the organizational structure created to manage BOS contracts varies tremendously across MAJCOMs and between bases. Thus, the generic BOS management model discussed here will be the program management office (PMO). This generally includes a military officer (or civilian equivalent) program manager (PM) and deputy and staff consisting of functional specialists (for example, civil engineering, supply, or transportation), program analysts, financial managers, quality assurance evaluators (QAE), manpower and quality advisors, or others. The CO and other contracting administrators may or may not be part of the PMO but, in any case, should always work closely with the PMO on all phases of the contract.

A key aspect of effective BOS management lies in how the PMO is organized in terms of skills, specialties, grades, and numbers of people (military and government civilian mix). Indeed, a big problem with BOS management is the lack of an Air Force standard officer specialty to serve in the PM capacity. Thus, the typical PM may come from a variety of career fields and be assigned with little or no education or training in commercial industry practices or service contracting. There have been situations where officers from four different career fields (civil engineering, logistics plans, supply, and acquisition) were successively assigned to the same PM position. None had any formal education, training, or prior hands-on experience in outsourced BOS services. This lack of experience, coupled with inconsistent directions to the contractor, led to serious disagreements and broken trusts that ultimately resulted

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in the contractor's winning a sizable lawsuit against the Air Force.

Likewise, other members of the PMO (usually enlisted or civilian functional specialists), though very experienced in their core specialties, often have little experience dealing with contractors using commercial practices. Also, when several single base services are consolidated into one large BOS contract, a PMO's responsibilities and span of control quickly grow in size and complexity. Add to this increased requirements for quality assurance, contracting, manpower, finance, legal, and multiple end-user customer requirements, along with contractor and subcontractor technical and management issues, and the job can become overwhelming. Management difficulties in bundling multiple, single-service contracts into a single, large BOS contract are underscored by an audit by the Air Force Audit Agency (AFAA).

In this case, five contracts supporting 22 base organizations were combined into one contract valued at \$35M. The key problems were:

- Due to of the magnitude of the consolidated acquisition, the PM was not fully prepared to monitor the fund status for the numerous organizations receiving support.
- Contracting personnel had reserved, competed, and awarded the contract to a small business. Consequently, the PM could not adequately assist contractor personnel who were inexperienced with maintaining the multitier cost schedules necessary to accurately report operations.
- The quality assurance director did not implement an effective quality assurance plan. Functional area chiefs (FAC) did not always report or document contract surveillance. FACs did not promptly develop and submit functional area surveillance plans or nominate quality assurance personnel.<sup>17</sup>

In this example, the PMO, contracting office, and quality assurance office were not working together as a single, unified team.

In building an effective PMO, there are some fundamental questions to be answered, such as:

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*It is important  
that a single PM  
be responsible for  
overall BOS  
management.*

- What kind of PMO organizational structure will work best based on the types and numbers of consolidated services and base mission?
- How does one effectively involve and integrate the different base functionals, end-user customers, QAE, and contracting officials to carry out cradle-to-grave BOS program and contract management?
- Who is ultimately going to be in charge and responsible for bringing these diverse elements together?

Based on the diverse workload and associated management complexities, it is important that a single PM be responsible for overall BOS management. Such unity of control is central to efficient and effective base-level BOS support to the warfighter. An important question that remains unanswered, however, is, what career field is best qualified to manage the unique, multifaceted skills BOS demands?

*PWS Development.* The OFPP says the PWS should describe the specific requirements the contractor must meet, standard of performance for the required tasks, and level of quality the government expects the contractor to provide. However, it should not include detailed procedures that dictate how the work is to be performed. Instead, it should center on what is to be performed.<sup>18</sup> Certainly, an accurate, complete, and well-written PWS is probably the most critical element for ensuring the government customer gets what it pays for. Yet, stories still abound concerning poorly written, ambiguously worded, and unclear old-style statements of work. Again, the causes for these problems are rooted in the traditional differences between the government and commercial ways of doing business, coupled with not enough education, training, and reinforcement to transition away from the military approach. Military-based (MILSPEC/MILSTD) *how to* technical orders are very different than commercial industry's flexible, ever-changing practices. Learning to speak the same language has been a slow process as the following examples illustrate.

An AFAA audit of custodial services found "Personnel did not establish custodial standards . . . 22 buildings . . . received, but did not qualify for, daily cleaning services."<sup>19</sup> Revising the contract to meet current

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standards of the Air Force Civil Engineering Standards Agency could save nearly \$400K over 6 years.<sup>20</sup> Similarly, a Government Accounting Office (GAO) study of BOS contracts at ten DoD installations identified “a well-defined performance work statement is the key to meeting these [results-oriented] requirements and preventing excessive modifications to contracts and unanticipated cost increases.”<sup>21</sup> On the positive side, as the government shifts its emphasis from what and how the work is performed to results and outcome, improved PWS should result.

*Quality Assurance Evaluation.* At the heart of measuring and documenting how well the contractor is performing (both negative and positive incentives) lies the QAE function. Properly performed QAE is essential to enabling the PM and CO to accurately assess all aspects of contract performance, including operations and maintenance, business management, and technical and engineering performance. However, once again, recent experience has shown that government QAE oversight of contractor work is deficient in a number of ways. A recent AFAA audit of a housing maintenance contract found “the quality surveillance plan (QASP) was not properly developed and the QAE did not correctly document all inspections.”<sup>22</sup> Accurate and complete QASPs and documentation of inspection results are essential to effective contract administration and good working relations with the contractor.

Trust is another key element of QAE. A RAND study on commercial practices in facility management (FM) found that the degree of mutual trust between the FM service buyer and seller determined the potential for mutual gain. Without trust, the relationship tends to be adversarial, and the focus is on close control with a reliance on many QAEs to ensure execution. Consequently, the relationship is typically short-term with frequent contract rebids and changes in providers.<sup>23</sup> This is not too different from the way DoD has traditionally carried out QAE, and it needs to change to become a cooperative partnership based on shared goals and outcomes.

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*An important question that remains unanswered, however, is, what career field is best qualified to manage the unique, multifaceted skills BOS demands?*

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*As the size and number of outsourced BOS contracts increase, the responsibilities of the contracting office and CO are certain to grow.*

Another important aspect about QAE is that too much monitoring of the contractor's performance can be costly. A 2000 RAND study on strategic sourcing found:

Customers may have a strong compulsion to track many different dimensions of operational performance and cost, feeling that it is necessary to maintain control and verify that their providers are achieving the agreed-upon level of performance within the specified budget.<sup>24</sup>

However, this control comes at a price since, in the end, the government customer pays for all information used to monitor service providers (for example, contract data requirement lists) and the time spent examining this information. Therefore, customers hurt only themselves by requesting any information that is not essential for making important decisions.<sup>25</sup>

*Contract Administration.* Once the PWS and QASP have been written and the contract source selection made, it is the quality of contract administration that ultimately determines the success or failure of outsourced BOS. Of all the members of the government program or contract team, the COs probably have the most influential role. Based on their warrant to obligate government funds, they have a special responsibility to ensure the government gets all the services for which it has contracted and paid. Indeed, they are the central players in developing commercial business plans and acquisition strategies and advising, training, and supporting the other government team members in carrying out BOS management. Since they are the contract experts, they are relied on more heavily to ensure others become knowledgeable about commercial industry practices and changes to acquisition and contract requirements.

Nonetheless, these high expectations may be unrealistic for several reasons. First, the normal, heavy contracting workload makes it difficult for COs to keep themselves fully apprised of the latest acquisition reforms, much less find time to train the PMO. Second, the government typically does not provide training on ever-changing commercial practices and how they might influence the customer. Third, depending on the complexity of the service area, a CO may not have the technical background

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necessary to provide advice on military versus commercial practices.

In any event, it is essential that the contracting office work closely with the PMO every step of the way. Together, they must ensure all parts of the source selection and follow-on management (for example, PWS, QASP, and incentives) are fully integrated, completely understood, and properly executed by all parties, including the contractor.

Regarding future outsourcing, as the size and number of outsourced BOS contracts increase, the responsibilities of the contracting office and CO are certain to grow. However, in making the transition to BOS, COs have a new ally. Of growing importance is the role of manpower and organization (MO) as an ongoing advisor or full member of the PMO. The MO is expected to play a key role in educating, training, facilitating, strategic planning, and guiding the development of performance metrics for BOS contracts. Following the integration of the old total quality management program into the MO career field, they now have responsibility for planning, advising, and facilitating organizational and functional process improvements, productivity enhancement studies, commercial industry best practices, wartime manpower requirements support, and others. The MO is also the focal point for performance management planning at the wing and MAJCOM levels.<sup>26</sup> Thus, the MO should be relied on to facilitate the integration of strategic performance goals of the warfighter with all the base support functions, no matter who provides the service (contract or most efficient organization [MEO]). Moreover, this could help encourage the cultural paradigm shift to seamless integration of commercially provided BOS services.

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*Of growing importance is the role of manpower and organization as an ongoing advisor or full member of the PMO. The MO is expected to play a key role in educating, training, facilitating, strategic planning, and guiding the development of performance metrics for BOS contracts.*

## **Improvements in Acquisition Reform and Air Force CS&P Policy**

*It is the policy of the Department of Defense that, in order to maximize performance, innovation, and competition, often at lower cost, performance-based strategies for the acquisition of services are to be used wherever possible . . . . Those cases in which*



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*The OFPP has been pursuing acquisition reform to ensure full implementation of key practices to move the government closer to the commercial model.*

*performance-based strategies are not employed should become the exceptions.*

—J. S. Gansler

Services account for nearly half the nearly \$200B the government spends annually through contracts.<sup>27</sup> Over the last 7 years, many improvements have been made to the statutory and regulatory structures that oversee procurement policy. In this regard, the OFPP has been pursuing acquisition reform to ensure full implementation of key practices to move the government closer to the commercial model:

- Making contractor performance a substantial factor in contract administration and source selection
- Encouraging contractors to innovate in deciding how to perform the work and tying payment to performance
- Using new contracting tools to obtain up-to-date technology and better prices<sup>28</sup>

### **Performance-Based Service Contracting**

Before implementing these changes, in 1994, the OFPP sponsored a performance-based service contracting (PBSC) project to test PBSC methods on contracts for recurring services (that were not performance-based) and measure the impact of PBSC. The goal was to test the hypothesis that PBSC saves money and encourage contractor performance that better supports mission attainment. Twenty-seven agencies and four industry groups, representing more than 1,000 companies, endorsed the project. Overall, 26 contracts (\$585M) from 15 agencies due to expire were resolicited using PBSC methods. The project's findings were based on before-and-after comparison and measured effects on price, performance, competition, audit workload, and procurement lead time.<sup>29</sup> The results were as follows:

- Price: on average, contract price decreased by 15 percent.
- Performance: customer (agency) satisfaction with the contractor's performance improved more than 18 percent. Ratings were obtained on five factors: quality, quantity, timeliness, cost-effectiveness, and overall

performance. Significantly increased customer satisfaction was reported on all criteria.

- Competition: the average number of offers increased from 5.3 to 7.3.
- Audit workload: the total number of contract audits decreased 93 percent.
- Procurement lead time: average total procurement lead time increased by 38 days (from 237 to 275), and average solicitation-to-award lead time increased by 33 days (from 140 to 173). However, almost half the contracts experienced decreases or remained the same. The overall increase was expected since agencies had to develop new PWS, performance standards, and quality assurance plans and incorporate untried and significantly different contracting methods to apply PBSC.<sup>30</sup>

While the overall study results are impressive, a closer look at an individual project illustrates the kinds of improvement opportunity that PBSC offers.

The Navy applied PBSC to a \$350M, 5-year contract for aircraft maintenance support for 357 T-34C and T-44A aircraft at 12 locations.<sup>31</sup> Important changes made by the Navy included:

- Separate tasks were defined in the PWs, and offerors fixed prices for each task. The minimum work statement read, “Provide Federal Aviation Administration (FAA)-certified personnel and facilities to perform scheduled and preventive maintenance in accordance with manufacturers’ publications, FAA directives, and Navy maintenance engineering directives over a range of aircraft quantities.”
- Measurable, performance-based metrics were then imposed (for example, aircraft 80-percent mission capable, ground abort rate less than 5 percent, and flight schedules met 100 percent).
- Streamlined acquisition procedures were used for the solicitation, and best-value award procedures were applied. A draft request for proposal was issued seeking industry inputs on alternatives to military specifications and standards. In response, many were deleted—some with no replacement—others were replaced with

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*In light of  
PBSC's early  
successes, the  
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include PBSC.*

commercial standards (International Standardization Organization [ISO] for 9000 series), and mitigating language was applied to the remainder.

- Under the contract, the contractor is held to a high standard of performance and is empowered to use the best commercial practices and management innovation to continually improve performance.
- The contract provided both positive and negative incentives based on quantifiable standards. On the positive side, materiel management functions were turned over to the contractor. Materiel is purchased on a cost-reimbursable basis, but the contractor can earn a 15-percent incentive for cost avoidance. On the negative side, the contract is priced at a ready-for-training rate of 75 percent. If this rate is not met, the contract price is reduced proportionately (for example, a 60-percent training rate would result in a 20-percent reduction in contract price). This incentive encourages optimum contractor performance in a critical customer area.<sup>32</sup>

This conversion to performance-based contracting resulted in immediate savings of \$25M from the previous nonperformance-based contract, and the Navy expects even more savings through positive and negative contract incentives.<sup>33</sup>

In light of PBSC's early successes, the *Federal Acquisition Regulation* (FAR) has been changed to include PBSC. FAR 37.601 defines the requirements of a performance-based contract as:

Requirements described in terms of results required rather than to methods of performance of the work.

Use of measurable performance standards (that is, terms of quality, timeliness, quantity, etc) and quality assurance surveillance plans.

Procedures for reduction of fee or for reductions to the price of fixed-price contract when services are not performed or do not meet contract requirements.

Use of performance incentives where appropriate.<sup>34</sup>

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Likewise, senior DoD leadership has embraced PBSC. On 5 April 2000, the Under Secretary of Defense (Acquisition, Technology, and Logistics) directed all DoD departments and agencies to acquire 50 percent of all services, measured in both actions and dollars, in a performance-based manner by the year 2005.<sup>35</sup> In concert with this, the Assistant Secretary of the Air Force for Acquisition sponsored the Acquisition Reform Reinvention Team with the goal of revolutionizing Air Force service contracting. They developed policies, procedures, and tools to remove barriers to implementing commercial practices. They also created the Air Force Service Contract Advisory Group II, consisting of functional experts for the particular service and contracting personnel from all levels (Air Staff, MAJCOM, wing) and commercial contractors. Moreover, in June 2000, the Air Force issued the PBSA implementation plan outlining current policies, procedures, and initiatives. This included a massive education and training effort to ensure quality assurance personnel, the functional communities, and others, from Headquarters Air Force to individual Air Force installations, understood and began applying PBSC to meet the 50-percent 2005 goal.<sup>36</sup> These aggressive initiatives suggest that better quality, performance-based PWSs, QASPs, and contracts should result and lead to improved BOS management.

## **BRAG**

To institutionalize PBSC, the Air Force had to overhaul procedures used to contract for services. Therefore, Air Force Instruction (AFI) 63-124, *Performance-Based Service Contracting*, was written to establish the framework and procedures for effective execution of PBSC.<sup>37</sup> It established the concept of the BRAG as the means to carry out PBSC. Established by installation commanders, the Business Requirements Advisory Group is, “A business solution team that consists of cross-functional personnel that plan and manage service contract outcomes to the satisfaction of its customers.”<sup>38</sup> BRAGs plan and manage service contracts throughout the life of a requirement. Working together, BRAG members

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*There are some downsides to the BRAG. The flexibility built into BRAGs can also lead to too little structure concerning the roles, responsibilities, and boundaries of the different organizations.*

conduct market research, define requirements, develop the contract structure, and set up quality and surveillance approaches. In addition, the BRAG has responsibilities for acquisition planning, development, and performance management for new (including A-76 studies) and follow-on service contracts.<sup>39</sup>

One big advantage of the BRAG is its flexible organization that can be tailored to fit the needs of an individual base. BRAGs can also be centralized for regional, MAJCOM, or combined MAJCOM-type acquisitions.<sup>40</sup> For BOS contracts, this flexibility is essential. Moreover, the standardized structural framework of BRAGs that brings together the PMs, contracting office, manpower, legal, financial, and functional communities could help improve cooperation and coordination on the government side of BOS.

However, there are some downsides to the BRAG. The flexibility built into BRAGs can also lead to too little structure concerning the roles, responsibilities, and boundaries of the different organizations. Moreover, the larger, more diverse, and complex the BOS, the greater the management challenges, leaving the question—who is in charge? The CO cannot do it, the MO cannot do it, and a functional specialist may not have the proper background, education, training, or experience to do it. Furthermore, AFI 63-124 does not address who can or should do it. Based on their extensive project management experience and the many similarities between procurement acquisition and services acquisition (for example, PMOs, integrated product teams [IPT]), acquisition officers may be a good choice. However, since they do not normally perform BOS-type, services-based acquisition and are not usually assigned at base level, more study is needed to see what role they could play.

In any case, senior Air Force leaders see the creation of BRAGs as a positive step toward implementing PBSC across the Air Force.

## **Leading-Edge BOS Program Management**

*The legacy of obsolete institutional structures and processes and organizations does not merely create*

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*unnecessary cost, which of course it does; it also imposes an unacceptable burden on national defense.*

—Donald Rumsfeld

In step with the recent improvements in acquisition reform and Air Force-level CS&P policy guidance, innovative leading-edge BOS program and performance-management organizations have emerged and are moving toward building strategic partnerships between the government and commercial service providers.

### **ACC Program Management Squadron**

The Air Combat Command (ACC) Program Management Squadron, located at Langley AFB, Virginia, has been in the outsourcing business since the late 1980s. The squadron is ACC's lead organization for directing and managing all aspects of operations, logistics, communications, and engineering for seven large-scale operations and maintenance contracts. The organization includes 134 military and civilians administering more than \$840M in contracts and \$3.5B in assets at 29 sites in the United States and 12 countries. The organization provides a unique cross-functional activity charged with program management of outsourced operational systems.<sup>41</sup>

These systems are operated and maintained through large-scale contracts supporting various government agencies in multinational environments. Overall responsibilities include planning, coordinating, managing, and budgeting services executed by contract or international support agreement. Other duties include contract management, performance certification, and assistance to other Air Force and ACC agencies in the development, program management, and administration of complex, large-scale contracts.<sup>42</sup>

This relatively flat organizational structure depicts seven major functional program and support divisions including civil engineering, computer-communications, logistics, surveillance, aircraft maintenance, plans and programs, and quality assurance. The program managers each receive support from the various functional areas and quality assurance rather than having these personnel embedded into the program management divisions. Other

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*The success of the ACC PMS is evident through growth in the number of ACC-wide programs within the organization. Also, the synergy gained from lessons learned and best practices within the different programs continues to benefit the squadron's success, making it a useful model for further study of BOS management.*

specialized support offices (information management, command data management, and financial management) are also located within the squadron.<sup>43</sup> The ACC Contracting Squadron provides contract administration. Based on the specialized nature and diversity of their contracts, the PMS maintains a balanced military and civilian mix to ensure program continuity and an infusion of new ideas and experiences.

Education and training are a top priority—assigned personnel receive a variety of on-the-job training, government continuing education, and training on commercial standards (for example, ISO 9000) and are also afforded the opportunity to earn master's certificates in areas such as project management and government contracting from George Washington University. This education and training is reinforced through writing PWS and QASPs for new and recurring source selections.<sup>44</sup>

For long-term acquisition planning, the PMS Plans and Programs Division performs strategic planning activities, prepares and coordinates acquisition planning, and heads new source selections and recompetitions.<sup>45</sup> One significant benefit of a separate division to study long-range issues (for example, mission evolution, commercial industry trends, and acquisition reform) is the program management personnel's ability to focus on current contracts.

The organization's management was very proactive in communicating information and strategies across programs that were well-supported by a robust, self-contained functional specialization support structure. Yet, they maintained a ready capability to contract outside help through consultants (for example, Army Corps of Engineers and specialized commercial consultants) when additional experience was needed. This *just in time* labor approach provided added capability at minimal cost.<sup>46</sup> The PMS has been transitioning to PBSC for new and recurring source selections.

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### **AETC Pick-A-Base Concept**

The Pick-A-Base (PaB) program is Air Education and Training Command's (AETC) strategic program for competitively sourcing BOS. The PaB concept grew out of Jump Start (a 1997 Air Staff initiative to identify potential competitive sourcing candidates) and AETC outsourcing lessons learned. Specifically, AETC found:

- Outsourcing done without a comprehensive plan leads to mission fragmentation—and multiple fragmented contracts and MEOs across the command.
- A-76 studies were very labor- and time-intensive, and transition to MEO or contract was turbulent.
- The larger the study, the larger the savings (for example, 301+ positions yielded an average 41-percent savings).

Based on these experiences, AETC decided to include as many base functions as possible within each A-76 study. It also combined existing contracts where possible. Together, these resulted in a reduction in the number of contracts at each base studied, which, in turn, meant larger BOS contracts that would attract world-class bidders and result in a higher class service. Thus, the PaB concept was born.<sup>47</sup>

Maxwell AFB, Alabama, is the first of five AETC bases to be competitively sourced under the PaB program. The four other PaB locations are Lackland AFB, Randolph AFB, and Sheppard AFB, Texas, and Keesler AFB, Mississippi.<sup>48</sup>

By actively incorporating PBSC principles, AETC is defining requirements in performance-based commercial terms and then monitoring contract performance using commercial methods. Accordingly, AETC is proactively building partnerships between the government and service providers. It does this by using modified, cost-reimbursement contracts to allow the sharing of savings (between the government and service provider) and through consolidation of varied facility management services.<sup>49</sup>

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*Thus far, some of the biggest AETC PaB successes are the aggressive command-wide shift to PBSC and the incorporation of BRAGs.*

Since the PaB concept is so new, it does not yet have the benefit of experience to back up just how successful it will be. However, the initial numbers from the Maxwell experience, in spite of turbulence in awarding the contract, appear promising. The overall manpower savings will be more than 300 people, and a lean PMO staff (9 to 12 people) will be responsible for BOS management. This will include contracting, manpower, and functional specialists covering the various contracted service functions. Functional specialists will be expected to perform three main duties—functional and technical, performance management, and data analysis.<sup>50</sup>

Overall, the approach is sound, but there are still many questions that need to be resolved, such as:

- Should the PMO be structured differently for an MEO versus a contractor win?
- How will performance monitoring and risk-sharing be carried out?
- Where will the PMO staff come from?
- What kinds of education and training will be provided?
- Who will be in charge of running the PMO (that is, have authority, responsibility, and accountability)?

Thus far, some of the biggest AETC PaB successes are the aggressive command-wide shift to PBSC and the incorporation of BRAGs. AETC's thorough market research, performance-management focus, emphasis on building long-term relationships through strategic partnering with the contractor, innovative contract incentives, and risk-sharing are best practices. Another potentially successful area (though still untested) is the much smaller, streamlined government PMO to perform contractor insight versus the old QAE oversight.

AETC has put tremendous effort into developing a comprehensive PaB program and is committed to ensuring its success. However, it still needs a lot of help from the senior Air Force leadership to make this happen. In a recent briefing, the AETC Director of Contracting cited four needs to ensure PaB's successful implementation.

- A business strategy for competitive sourcing integrated at the Air Force/MAJCOM/base level

- A reassessment of small business roles
- Cross-functional cooperation starting at the top
- A system to make this all happen<sup>51</sup>

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## **NASA-Patrick AFB: Joint Performance Management Office**

The Joint Performance Management Office (JPMO), a National Aeronautics and Space Administration (Kennedy Space Center) and Air Force Space Command (Patrick AFB) partnership, was established for contract management of the Joint Base Operation and Support Contract (J-BOSC). These partnering efforts were focused on improving efficiencies and greatly reducing costs to support the nation's spacelift requirements while strengthening the reality of a Cape Canaveral spaceport. J-BOSC is a PBSC, awarded in October 1998, and covers a 5-year base period with one 5-year option valued at approximately \$2.2B over the 10-year period.<sup>52</sup> It replaced 18 separate base-support contracts encompassing more than 160,000 acres and three geographically separated locations and saved \$35M through the consolidation.<sup>53</sup> Figure 1 shows the projected savings between J-BOSC and separate contracts.

Military and civilian personnel from NASA and the Air Force staff the JPMO, which reports through an executive director to the 45<sup>th</sup> Space Wing and Kennedy Space Center board of directors. Consisting of senior management from both agencies (for example, financial, contracting, legal, operations and support commanders and directors), the board issues policy and guidance for the JPMO.

The JPMO structure is divided into five offices—Executive Management, Contracting, Staff, and Integration. Eighteen IPTs, consisting of JPMO members as lead, with contractor and stakeholders, provide a forum where new requirements can be discussed and contract issues resolved. The IPTs also provide regular customer feedback directly to the contractor, establish performance standards, and perform *contract insight* (versus the old-style notion of QAE oversight).<sup>55</sup>

To ensure unified operations, the JPMO incorporated the best practices of NASA and the Air Force to develop a single business system that includes daily operations

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*Besides the huge, initial cost savings, the results of the consolidation have been enormously successful in improving BOS management.*

procedures and a strategic planning system that complies with both NASA and Air Force policies. This system was certified ISO-9001 compliant in June 1999.<sup>56</sup>

Besides the huge, initial cost savings, the results of the consolidation have been enormously successful in improving BOS management. For example, earlier contracts required 200 people to perform contract oversight. Now the JPMO—using insight—requires only 40 NASA and Air Force civilian and military people to assess contractor performance.<sup>57</sup> In addition, both agencies have benefited from *one stop shopping* for customer service. When someone needs NASA support or Air Force support, be it a government or commercial customer, only one number has to be called for assistance. Perhaps the most important improvement is the 24-hour-turnaround on the launch range. Consecutive launches within 24 hours of each other are now possible—this had never been done before JPMO was established.<sup>58</sup>

The increased efficiencies gained by J-BOSC have allowed the Kennedy Space Center and the 45<sup>th</sup> Space Wing to recapitalize and improve their infrastructure and initiative innovations to improve customer service and satisfaction. They also underscore that joint partnerships in the outsourced BOS arena can achieve winning outcomes, not only for the partners but also for the numerous customers and stakeholders and the service-

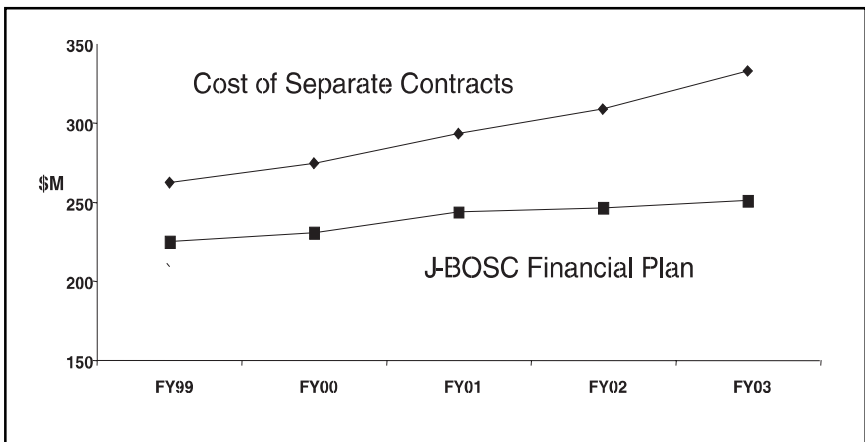


Figure 1. BOS Savings Estimates<sup>54</sup>

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provider contractor. The JPMO effectively communicates updates and announcements through the quarterly *Joint Update Newsletter* and a well-maintained website that contains a wealth of useful links, including contract, award fee, IPT, and customer web pages.

In summary, the innovative BOS management approaches illustrated above prove that CS&P can be successful. Similarly, many other DoD organizations have achieved comparable successes with their BOS outsourcing programs. Likewise, as more is learned about commercially provided BOS services and best practices are learned and shared with others, even greater BOS success can be expected.

## Conclusion and Recommendations

*Our success to date doesn't mean that our task is complete—on the contrary, so long as inefficient practices still exist—defense reform will remain one of my highest priorities.*

—William S. Cohen

In conclusion, BOS contracting is a unique, complex, and challenging but vitally important Air Force CS&P program that will continue to grow. In its zeal to quickly implement outsourcing, the Air Force allowed many nonstandard approaches in program management and contract administration that led to problems and negatively impacted costs, efficiencies, and overall BOS performance. However, new Air Force-level CS&P guidance and improved acquisition practices such as PBSC and the widespread establishment of BRAGs suggest more BOS improvements will be forthcoming. Also promising are an increasing number of innovative, leading-edge BOS organizations that are benchmarking and sharing best practices with others.

In assessing the progress in BOS management against the four principal Air Force CS&P goals, one gains a little clearer picture of where we have been and where we still need to go.

*Sustain Readiness.* At this time, it is too early to say, but if the CS&P promise to free military members to concentrate more on their core competencies holds true,

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*Overall, the Air Force is heading down the right path with BOS CS&P but still has a long way to go.*

it could provide some badly needed relief. However, there are many unknowns, and much more study lies ahead for the manpower, personnel, and other functional communities.

*Improve Performance and Quality by Doing Business More Efficiently and Cost Effectively.* All the CS&P evidence suggests that, whether the in-house MEO or contractor bid wins, the service becomes leaner and more efficient. Yet, more study is needed to determine the optimal PMO structures and staffing for monitoring either MEO or commercial contractor performance and ensuring efficiencies and performance can be maintained and improved over time.

*Generate Funds for Force Modernization.* Available Air Force cost data suggest that outsourced BOS is generating significant savings that can be applied toward modernization. Still, many problems must be resolved to improve and continue this positive trend. DoD-wide, there needs to be a common definition and framework for BOS along with a standardized cost-accounting system that can generate and track accurate, comparable cost data. Also, it must be remembered that, over time, changes in mission requirements, technologies, competitive pressures, politics, and a host of other factors could impact these savings in unpredictable ways.

*Focus Personnel and Resources on Core Air Force Missions.* Great care must be exercised to maintain the right balance and mix of highly skilled and motivated airmen necessary to fully meet the needs of the new expeditionary aerospace force. When all is said and done, it is essential that the many promises of outsourced BOS be realized through more effective support to the end-user—the warfighter.

Overall, the Air Force is heading down the right path with BOS CS&P but still has a long way to go. The following recommendations are offered to help facilitate greater cost savings and improved BOS management.

- The Air Force must be aggressive in ensuring the rules and tools for successful implementation of acquisition reform and CS&P policies (for example, PBSC) are known and applied everywhere and at all levels. This

will require senior Air Force leadership to set the tone and lead the way. Moreover, continued support from MAJCOMs and various CS&P support and advisory agencies to base-level BOS managers will help ensure outsourced BOS services are successful.

- The Air Force should reevaluate and restructure the PMO organization and practices to optimize its efficiency and effectiveness but leave it flexible enough to be tailored to best meet a base's support needs and mission requirements. The question of who is in charge still needs to be answered. The BRAG concept is a good start, but it offers no answers on how to organize and build an effective PMO team.
- Greater emphasis on education and training on commercial philosophies and business practices needs to take place at the base-level PMO. This should result in a more cohesive and capable government (military and civilian) team that can strategically partner with commercial service providers for improved BOS performance at a lower cost. It will also require a greater commitment from senior Air Force leadership to provide funding and opportunities for world-class education and training to help build a motivated and professional PMO staff.
- The Air Force should reevaluate officer, enlisted, and civilian career-field job descriptions and core competencies against those required for BOS management. The growing demands of outsourced BOS services demonstrate that the functional career fields now require balanced sets of competencies and skills (core warfighting and contracted mission support) to be most effective both at home station and while deployed.
- Because commercially supplied BOS services will become the norm in the future, the Air Force must find new ways to influence a cultural shift (within the military and civilian work force) to actively foster and build long-term relationships with world-class BOS service providers based on mutual trust. Once again, the vision, leadership, and example must begin at the top and permeate through the MAJCOM functional staffs down to the base-level environment.

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- There must also be a shift in emphasis from QAE (oversight) toward performance management (insight). This implies a significant reduction in QA staffs that currently perform oversight and a corresponding shift based on greater trust and reliance on the contractor's quality control and improvement processes.
- Improvements and refinements will be required in how incentives (for example, award-fee programs and award terms) are managed to attract, secure, and retain only the best service providers. Furthermore, it must be remembered that this is a two-way street. To attract the best service providers, the Air Force needs to prove itself a trustworthy and reliable buyer of BOS services.

The success of CS&P and outsourced BOS services is important to the future of the Air Force. If done right, better managed BOS services can lead to significantly greater cost savings for future procurement, more efficient and effective base support business practices, and improved readiness—all of which can contribute to increased military capability and better support to the warfighter.

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## Notable Quotes

*Any amateur can shove tanks, planes, and infantry around the map; the real business of war is getting gas, ammunition, and spare parts to the people that need them, where they need them . . . the tail, in the form of logistics, will more and more wag the dog . . . logistics will increasingly become the single greatest impediment to have real combat capability.*

**Edgar Ulsamer**

*The first prerequisite for any regular logistics system is, of course, an exact definition of requirements.*

**Martin van Crevald**

*Amateurs worry about strategy. Dilettantes worry about tactics. Professionals worry about logistics.*

**~Anonymous**

*We are expected always to have produced tomorrow's equipment yesterday.*

**Gen Benjamin W. Chidlaw, USAF**

*Prejudice against innovation is a typical characteristic of the officer corps that has grown up in a well-tried and proven system.*

**Field Marshal Erwin Rommel**

*Logistics . . . embraces not merely the traditional functions of supply and transportation in the field, but also war finance, ship construction, munitions manufacture, and other aspects of war economy.*

**Lieutenant Colonel George C. Thorpe, USMC**

Joint Publication 4-0, *Doctrine for Logistic Support of Joint Operations*, requires the individual Services to balance sustainability of combat capability with economy in the context of long-term objectives and capabilities.

# Out



**When near-term fiscal expediency becomes the prime driver behind weapon system sustainment, we put long-term military readiness at great risk.**

# **sourcing**

## **Military Readiness and Outsourcing Depot Repair**

Today's modernization (with proper life-cycle planning and investment, to support complex, eventually decades-old, military-unique hardware that is the linchpin of national security) is tomorrow's readiness.

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**Captain Kenneth B. Bowling, USAF**

**C**haos theory attempts to explain the fact that complex and unpredictable results will occur in systems that are sensitive to their initial conditions. A common example of this is known as the Butterfly Effect. In theory, the flutter of a butterfly's wings in China could affect weather patterns in New Mexico, thousands of miles away. In other words, it is possible for a very small occurrence to produce unpredictable and sometimes drastic results by triggering a series of increasingly significant events.

When near-term fiscal expediency becomes the prime driver behind weapon system sustainment, we put long-term military readiness at great risk. The choice to outsource Air Force depot-level repair in a tightly constrained budgetary environment has neglected long-term, investment-based planning and chosen, instead, near-term executability. Leveraging the revolution in business affairs and acquisition reforms are constantly talked up as a cure to the ills of the acquisition and logistics business and as sources for desperately needed modernization funding. The dialogue is unbalanced, and the

## Military Readiness and Outsourcing Depot Repair



*Long-term investors understand a fundamental concept: the earliest investments reap the greatest returns over a long term.*

proof is lacking. Thus, the question, are we declaring victory without results?

### Background

A former Chairman of the Joint Chiefs of Staff told Congress several years ago, “Today’s modernization is tomorrow’s readiness.” This is an outstanding statement! However, the statement is more instructive when restated in the following way, *Today’s modernization [with proper life-cycle planning and investment, to support complex, eventually decades-old, military-unique hardware that is the linchpin of national security] is tomorrow’s readiness.* The crux of this article is proper life-cycle planning and investment are not taking place, and the primary culprit is the Source of Repair Assignment Process (SORAP).

Long-term investors understand a fundamental concept: the earliest investments reap the greatest returns over a long term. In other words, because time is so powerful, make your biggest investments as soon as possible. Another well-understood concept is nearly intuitive—scarce resources with high demand drive up prices. Finally, business practices call for providing services at the lowest cost in order to maximize profit and minimize loss. All of these are simple, instructive, and useful in many aspects of life, including long-term support of major weapon systems.

In this case, the investment to be made occurs (or should occur) in repair technologies, infrastructure, training, technical data, and human capital at the Air Force air logistics centers (ALC), also referred to as depots.

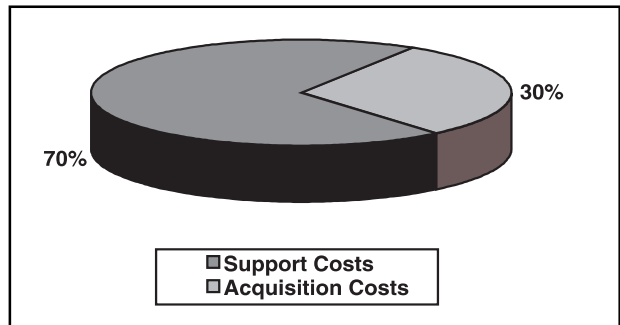


Figure 1. Percent of Life-Cycle Dollars

Second, the limited resources being considered are depot-level repair contractors. Finally, the business question is, what is the long-term best business choice for depot-level repair of our weapons systems, especially considering two primary factors:

- The Air Force cannot *divest* itself of its mission and go into a more lucrative market sector.
- The weapon systems being repaired today will be around for at least the next two generations.

So a limited contractor base is driving up repair costs (if we rely on them), and long-term support must get cheaper or face insolvency. These seem to be divergent planning factors, but they are not. We can and must plan for both because this is reality. Today, more than ever, planners, budgeters, and managers fail to recognize the macroeconomics lesson that reveals the proper perspective: *near-term investment provides long-term payback*.

I am not claiming subject matter expertise. In fact, Joint Publication 4-0, *Doctrine for Logistic Support of Joint Operations*, requires the individual Services to balance sustainability of combat capability with economy in the context of long-term objectives and capabilities.<sup>1</sup> It further states that this *balancing act* is the greatest challenge to the logistician. This is an unchallenged truth. With great pain, many senior leaders recognize supporting military-unique hardware for up to 4 or 5 decades (for example, B-52, KC-135, C-141, C-5, F-15, F-16, and Minuteman III) is *expensive and complex*. Also self-evident is the fact that reducing operations and support costs, particularly for an aging fleet, is the key to realizing long-term savings to be rolled into modernization efforts.

## Competition Is Key

One way to achieve these cost savings is competition, according to Secretary of Defense William S. Cohen in his November 1997 Defense Reform Initiative Report.<sup>2</sup> “Competition between the public and private sectors works.” This may be true, but competing weapon system support with a sharply decreased defense industrial base can have unintended pitfalls unless they are identified and

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*While it is clear that TSPR can alleviate the reliance on depot infrastructure, it is not clear whether this will result in a long-term cost savings arrangement.*

avoided. The government's efforts to encourage defense industry consolidation were certainly prudent, but the results are today's near absence of private (that is, nongovernment) competition. In the aerospace sector, for example, some 40 different companies have consolidated into 5: Lockheed Martin, Boeing, Pratt & Whitney, General Electric, and Raytheon.

Critics of the consolidation warn that we are in danger of compromising our security as a result. Further, the present situation creates the danger of monopolistic behavior on the part of surviving companies. They also call for increased competition from defense business as the real cost-saver for future programs.

Fortunately, the government has, in the case of long-term sustainment of aerospace systems, had a built in competitor. Over the last decade, air logistics centers have been able to compete effectively with the consolidated defense sector, thus keeping prices for outsourced work within reasonable limits. However, with the closing of two of the Air Force's five logistics centers and ever-increasing, aging-aircraft complications, the Air Force is relying more and more on outside repair contracts. Recently, this has been throttled by 50/50 issues that have been reached and exceeded. Nonetheless, there is a continuing pressure to move toward a Total System Performance Responsibility (TSPR) form of outsourcing.

While it is clear that TSPR can alleviate the reliance on depot infrastructure, it is not clear whether this will result in a long-term cost savings arrangement. There are several examples, both successful and not successful. In the near-term, TSPR contracts require little or no depot investment (infrastructure, training, manpower, technical data, and so forth). In the latter stages of a weapon system's life-cycle, the risk of having no competition (public or private) for repair will ultimately lead to cost growth and inflation (monopolistic behavior). Monopolies are broken up for this very reason. Finally, in spite of TSPR and best intentions, repairs and readiness cost are *eating our lunch*.

Regrettably, the Department of Defense and the Air Force, in particular, have leveraged tomorrow's readiness in an attempt to remain solvent in a budgetary drought.

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As a short term fix, we continue to increase modification programs that extend the life of our aging aircraft, while leaders look to acquisition and logistics reforms (particularly at our depots) to do the monumental task of creating savings for future modernization investment.

## Acquisition Reforms

As early as 1986, the Packard Commission suggested methods to reform the acquisition business. Clearly, its suggestions were well intended but had an obvious focus on the buying side of the acquisition equation. The Goldwater-Nichols Act codified several of the commission's suggestions, primarily by moving acquisition from military to civilian control and establishing portfolio managers for classes of weapon systems called program executive officers. Further, in the early 1990s, the Air Force established a concept called Integrated Weapon System Management (IWSM). This paradigm emerged as the first real step toward radical reform in defense acquisition and logistics for the Air Force.

A keystone of IWSM is the single-manager concept, where one individual has cradle to grave responsibility for an entire weapon system. In theory, IWSM would solve a long disliked process of one organization acquiring a weapon system and then tossing it over the wall for *loggies* to maintain.

From the long-term sustainment perspective, the problem with IWSM is that many development system managers (DSM) at Air Force product centers (Aeronautical Systems Center, Electronic Systems Center, Air Armament Center, Space and Missile Systems Center) retain single-manager responsibility decades after a system has been fielded, unlike system support managers (SSM) at air logistic centers (Oklahoma City ALC, Ogden ALC, Warner-Robins ALC). This is problematic because very few single-manager (DSM) offices are staffed with experts in depot logistics support. Further, these single managers continue to press for long-term sustainment by prime contractors via extremely limited competitions or sole-source contracts such as TSPR.

## Military Readiness and Outsourcing Depot Repair

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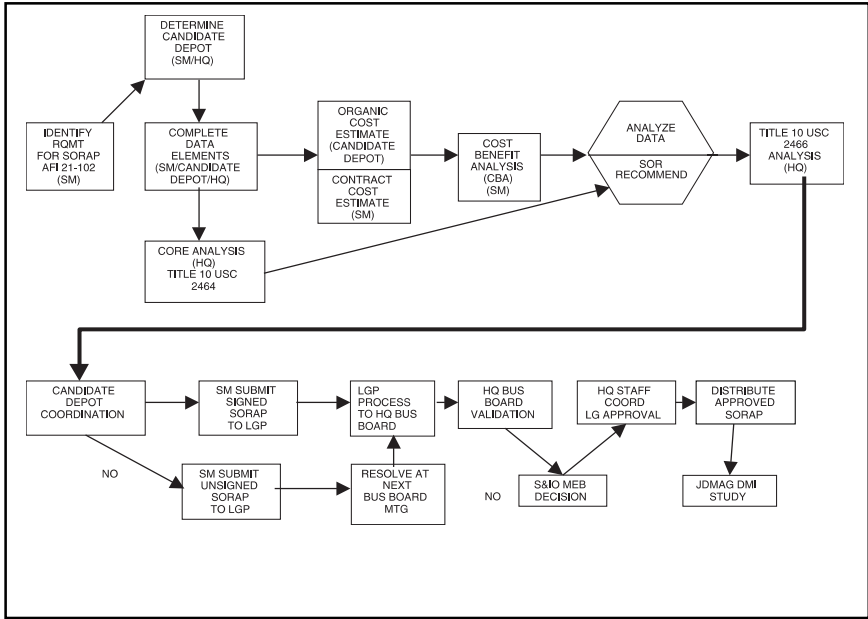


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*ISMs are under  
tremendous  
pressure to field  
a system—their  
system.*

By default, single managers (DSMs) are, first and foremost, advocates for their single system, not necessarily for the Air Force enterprise. For this reason, they are primarily fielding advocates. But single managers are not just responsible for acquisition; they are cradle to grave owners, responsible for the entire life cycle. Reality is different. Putting rubber on the ramp mentalities and political pressures did not disappear when IWSM was initiated. Therefore, ISMs are under tremendous pressure to field a system—their system. The argument is that without a *cradle* there is no reason for a *grave*. Some assert the opposing view: if you cannot support the weapon, then why birth it in the first place?

Early in the phase of an acquisition program, DSMs holding the single-manager title lack a true peer who is the proponent for long-term sustainment of individual weapon systems and the Air Force enterprise as a whole. Later in the program, long after many key decisions (investment-type) have been made, a system support manager is designated, usually at the target depot. In many cases, tension surfaces in the relationship between the



**Figure 2. US Air Force Source of Repair Process**

SSM and single manager (still wearing the DSM hat). The SSM reports to the single manager for programmatic issues. Frequently, the single manager does not have a clear understanding of sustainment issues and maintains the rubber-on-the-ramp view that does not deal with the realities of lifetime sustainment. Unthrottled, near-term executability is absolutely paramount on this single manager's list.

This dilemma ignores the long-term commitment of sustainment and its daily changes. One reason is sustainment relies on the private sector, which expands and contracts to supply and demand, or the public sector (for example, depots) that base realignment and closure shut down by 40 percent. Further complicating the issue, there is no mechanism that forces disagreements between SSMs and DSMs to be resolved by program executive offices in consultation with the target ALC commanders.

In some cases, this does happen. The problem is the SSM usually does not get a strong voice above the single manager (their boss). Logistics support considerations often take a back seat, placing great risk on ownership costs for the warfighters and long-term readiness of the force. It flies in the face of Defense Acquisition University course lessons teaching that, during the system engineering process, long-term logistics support considerations are equal to cost and performance considerations when tradeoffs are being considered. Critics contend reality differs from theory. Therefore, let us reconcile reality and theory with an example.

### Case in Point

SORAP is the primary process for making depot maintenance source-of-repair (SOR) determinations and for assessing organic depot-maintenance requirements in accordance with Department of Defense Directive (DoDD) 4151.18, *Maintenance of Military Materiel*,<sup>3</sup> and Air Force Instruction (AFI) 21-102, *Depot Maintenance Management*.<sup>4</sup> SOR decisions fall under a very broad umbrella called the Acquisition Strategy Panel, which is usually chaired by a program executive office and briefed by the DSM very early in the programs life-cycle. SORAP is used to determine the best-value source of depot-level

*Frequently, the single manager does not have a clear understanding of sustainment issues and maintains the rubber-on-the-ramp view that does not deal with the realities of lifetime sustainment.*

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*The process is flawed because it is implemented with loopholes and final decisions based on near-term benefits and politically motivated rationales.*

repair to support life-cycle readiness. Further, the SORAP must be completed and approved for all depot-level maintenance workloads generated by new acquisitions and modifications. The process is flawed because it is implemented with loopholes and final decisions based on near-term benefits and politically motivated rationales.

The definition of the phrase *best value* is an ambiguous loophole that lends itself to being misapplied for near-term gain and pressures to field a system or modification without delay, despite known logistics concerns. Prior to IWSM, there were two four-star commands, Air Force Systems Command and Air Force Logistics Command, that were strong advocates for acquisition and sustainment during the acquisition cycle. True, they were operating under very different fiscal constraints, but they were always equal advocates. Today, proper advocacy should come from within the IWSM framework. The integrated product team (IPT) concept is designed to alleviate gross oversight of life-cycle cost considerations. While advocacy will not always solve problems, a clear imbalance removes a safety net and has become the overarching flaw in this process. If the IPT fails, balanced risk management does not exist for the long term. Unfortunately, advocacy is not the only problem with the SORAP.

Premature SOR determinations are the second misapplication of SORAP methodology and occur when SOR determinations (either contractor or organic) are made too early in the acquisition cycle. The reason for this is, again, shortsightedness. The SORAP manual states, "It is essential that actions required to obtain a SOR decision be taken as early as possible to avoid the expense and program turbulence associated with protecting both options until a decision is made."<sup>5</sup> It also states, "life-cycle support decisions are made early in the design . . . rather than waiting until after the design is completed." I agree that waiting until the design is completed is overly cautious, but protecting both options until the design stabilizes is prudent. The manual goes on to state, "The single manager should initiate actions as soon as reasonable . . . but not later than the decision to proceed into engineering and manufacturing development." The

design is only conceptual at this point for many of the subsystems of the end item. Detailed support planning, by all accounts, consists of bare estimates at this early stage, guesswork in many cases. If we plan to have no organic repair for an item and the design is substantially altered and/or logistics analyses prove inaccurate, the unprotected option becomes far more expensive than it would have been if we had paid the liability insurance to protect against this possibility.

The third miss in the SORAP process revolves around defining who bears the fiscal load. Single managers see investing in a new repair technology at an air logistics center as a burden to their program. Hypothetically, if the engine selected for the F-22 were similar to that of the joint strike fighter and others, the F-22 program might have to bear the fiscal load of the initial investment to establish the repair capability at the depot. The investment required might be large compared to other program costs (special tools, training, depot-level technical orders, facilities, and so forth.). The good news is that repair costs are controllable and not subject to the whims of market forces. The problem for the single manager is this is a *must pay bill* now. The single manager may not have sufficient insight into the design to properly budget for such a large bill in a particular year. This lapse creates a supportability issue for the program.

Then the contractor estimate arrives, and it is much lower because it can do the repairs for a slightly higher cost than the government but without any up-front investment because it already owns the capital equipment, facilities, and skilled labor (all used in production and testing). The likely result is no investment is made for organic repair. The effort goes sole-source to the original developer, and the life-cycle risk jumped another notch. This is especially, even catastrophically, true if that contractor's business base contracts as it responds to the market's supply and demand.

The investment decision would have provided the opportunity to reduce life-cycle costs for multiple weapon systems. This is the greater good concept that the SORAP ignores. It is the best-value loophole in action. The decision appeared to be the best value, but it was measured

*Single managers see investing in a new repair technology at an air logistics center as a burden to their program.*

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*The fact remains:  
organic  
supportability  
requires  
investment in  
infrastructure,  
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unplanned and  
unbudgeted.*

only in that year, and we again declared victory before results. The lost savings in outyears would have provided needed funds for future modernization efforts. At the same time, it would keep the work force at the air logistics centers current on new technology. Instead, the decision relegates the blue-collar work force at the depots to antique fixer and dealer status (nothing new to repair, just the old stuff). As an aside, ask yourself, what youth today would want a job fixing half-century old parts at a government depot when they could work for a defense contractor making higher pay repairing new technology? The implications are astounding.

Until there is a fundamental change in policy, there is no chance this trend will reverse naturally. According to DoDD 5000.2-R, *Mandatory Procedures for Major Acquisition Programs and Major Automated Information Acquisition Programs*,<sup>6</sup> cost must be viewed as an independent variable. Accordingly, single managers are required to establish aggressive but realistic objectives for all programs and follow through by trading performance, supportability, cost, and schedule, beginning early in the program. This is not happening because withholding program funds for unknown support investments is nearly taboo, especially when that investment will not realize a positive return on the investment for many years. The fact remains: organic supportability requires investment in infrastructure, equipment, and training, but it usually goes unplanned and unbudgeted.

The fourth flaw in the process focuses on logistics support analyses (LSA). These analyses—including mean time between failure, failure mode effects and criticality, repair level, and other maintenance-related analyses—are completed by prime contractors. Two problems arise. First, the decisions of the SORAP are often complete before these LSAs are mature; therefore, decisions about repair requirements and their associated costs are basically guesses. Two, the entity that stands to gain the most if repairs are contracted out is the prime contractor. The cost comparison model of the SORAP considers numbers of repairs, difficulty of repairs, cost of repairs, and so on as part of the best-value calculation. All these are outputs from the LSA process. Carefully crafted analyses by

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profit-minded contractors, in a shrinking business base, desperate for more business will almost certainly drive SOR determinations (especially for new technology) back into their own hands.

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## Outsourcing Reality

Acquisition and logistics reforms and the movement toward outsourcing are reality. They are unproven in the long term but a reality, nonetheless. According to Secretary of Defense Cohen, “We see its [outsourcing and competition] fruits every day in the better service it gives our troops and the better balance it gives our ledgers. It empowers workers, both public and private, challenging them to provide higher quality and lower cost.”

I agree we can see short-term *fruits* every day. Will we see them in 20 or 30 years is the question. What is not said about the short term is equally alarming. Overhead rates for outsourced work are skyrocketing, especially for sole-source vendors. This unplanned backlash is not easily disentangled or publicly touted.

## Final Thoughts

Commercial entities are loyal primarily to stockholders and profit-minded executives, not taxpayers. Therefore, when a business segment is 10, 20, or 30 years old or becomes inefficient, it is divested. What remains? Diminishing sources of repair, poor supply response, and parts shortages. Every day there are businesses going out of the business and the victims of outsourcing (warriors) frantically returning to the organic depot repair facility for emergency situations—a day late and a dollar short.

Historically, senior leaders and strategic planners mistrusted ideas that were radical, rapid, and revolutionary. They preferred calculated, complete, and correct. The SORAP and outsourcing, in general, stand as examples of getting the order wrong. The, “Fire! Ready! Aim!” syndrome has arrived. Ultimately, it is a question of who pays the highest price? Is it the warfighters in the battlespace, American who pays taxes, or a country that loses an irreplaceable treasure—a son, a daughter, or perhaps worse yet, *freedom*?

*Acquisition and logistics reforms and the movement toward outsourcing are reality. They are unproven in the long term but a reality, nonetheless.*

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## Notable Quotes

*Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act, logistics brings the troops to that point.*

**General Antoine Henri Jomini**

*Reduction of logistics troops is called “cutting out the fat” in press releases.*

**Gen Carter B. Magruder, USA**

*Let it be admitted that the modern technological revolution has confronted us with military problems of unprecedented complexity, problems made all the more difficult because of the social and political turbulence of the age in which we live. But precisely because of these revolutionary developments, let me suggest that you had better study military history, indeed all history, as no generation of military men have studied it before.*

**Frank Craven**

*Among military matters, logistics is particularly complex. Decision should be made at those points where there is understanding, and only on the broadest logistic subjects is there understanding at a high level*

**Gen Carter B. Magruder, USA**

*The whole of military activity must relate directly or indirectly to the engagement. The end for which a soldier is recruited, clothed, armed, and trained, the whole object of his sleeping, eating, drinking, and marching is simply that he should fight at the right place and the right time.*

**Clausewitz**



Award fees can be used in cost contracts in which contractors are reimbursed actual costs or in fixed-price contracts in which the contractor is guaranteed a fixed price no matter what costs are. Additionally, award fees can be used in conjunction with fixed fees.

# Con



**As the use of incentive contracts increases in both the public and private sectors, debate over their use has also increased among the professional acquisition community.**

# tracting

## **Analysis of Air Force Contract Implementation**

The Air Force uses numerous types of incentives to motivate contractors to either save money or perform at a level considered above satisfactory.

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**Major Thomas J. Snyder, USAF**

The use of incentive contracts by Federal agencies, including the Air Force, has increased significantly in the last 20 years. Incentives (in time or money) are given to contractors for specific results or quality standards. As the use of incentive contracts increases in both the public and private sectors, debate over their use has also increased among the professional acquisition community. Recent professional discourse includes anecdotal experiences centered on whether or not incentive contracts are implemented properly in the Air Force. Specifically, there are concerns that award-fee incentives or the newest hybrid award terms are not being implemented in a manner consistent with their original intent. Also, it is possible that the application of these instruments to motivate contractors could give incentive to the wrong behavior and be detrimental to acquisition initiatives.

The Air Force uses numerous types of incentives to motivate contractors to either save money or perform at a level

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## Analysis of Air Force Contract Implementation



*A convergence of government forces in the 1960s led to the development of the award-fee process currently used in government contracting.*

considered above satisfactory. Award-fee contracts, through which contractors are evaluated and granted additional money for excellent performance, are popular within the Air Force acquisition community. Their popularity has spawned a new award term, in which contractors are granted contract extensions in lieu of money.

Award fees can be used in cost contracts in which contractors are reimbursed actual costs or in fixed-price contracts in which the contractor is guaranteed a fixed price no matter what costs are. Additionally, award fees can be used in conjunction with fixed fees. For example, a contractor can be granted costs plus a fixed fee for just meeting standards and an award fee on top of that depending on how far those standards are exceeded. For purposes of this article, the term *award fee* will refer to fixed-price contracts only, without a fixed fee. These award-fee contracts have a fixed price and an available pool of dollars, which the contractor may earn in any percentage from 0-100, based on performance level.

### History of Award-Fee Incentives

This type of contract gives a company a definite incentive to cut its costs. In fact, the heart of the contract is the conviction that American business can perform miracles of low-cost production given a profit incentive for doing so.

#### Under Secretary of the Navy Forrestal

Attempts by Federal agencies to motivate contractors using incentives reach back to the American Civil War. The *Monitor*, the Navy's ironclad ship, was bought using a contract that included a performance incentive.<sup>1</sup> Another famous use of contract incentives involved the country's first aircraft buy. The Army Signal Corps' contract with the Wright Brothers included a performance incentive based on flight speed. A \$25K flat price was established for a 40-mile-per-hour flight, but the contract also included positive and negative incentives for actual speed obtained. The aircraft flew 42 miles per hour, and the brothers received a \$5K incentive payment.<sup>2</sup>

Incentives were also common during both world wars. Navy contracts with Bethlehem Steel for shipbuilding in

World War I included incentive fees for performance and capital investment.<sup>3</sup> During mobilization for World War II, competitive bidding was overcome by the urgency of the times. War Production Board Directive No 2, 3 March 1942, stated that formally advertised bid procedures were not to be used in war contracts; negotiation was to be used (as it was in other mobilizations). The directive also established three criteria for contracts: speed of delivery, conservation of superior facilities for the more difficult items of production, and placing contracts with firms needing the least amount of additional machinery and equipment.<sup>4</sup> This need for speed encouraged the Army and Navy to break new ground in contract terms. The War Department developed an *evaluated-fee* contract similar to the cost-plus-fixed fee construction contracts of World War I, except part of the fee varied depending on the contractor's performance. The Navy's Bureau of Ships also modified the cost-plus-fixed-fee contract so a portion of the fee was firm and the rest was paid as a bonus for achieving cost savings. This contract appeared in 1943 in large shipbuilding programs and some ordnance items.<sup>5</sup> These innovations were the precursors of the award-fee contract that is so popular today. Under Secretary of the Navy James V. Forrestal was a grand proponent of incentive contracts, and in 1943, the Navy tried to convert as many of its contracts as possible to incentive contracts. However, industry gave lackluster support to the initiative because of its lack of experience with contracts and frequent government contract changes. Production experience was low, so contractors had difficulty estimating costs, and government changes and interference often interrupted delivery schedules. Consequently, contractors were cool to incentives because they did not want their profit tied to changing goals. The lesson learned was that incentive contracts can be powerful but must be used at the right time and place and under the right conditions to be truly effective. The National Aeronautics and Space Administration (NASA) would successfully reintroduce this incentive 20 years later.

### **Award Fee Comes of Age**

A convergence of government forces in the 1960s led to the development of the award-fee process currently used

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## Analysis of Air Force Contract Implementation

*The Air Force was reluctant to jump into the award-fee game and did not issue its first contract until 1964. After the Electronic Systems Division issued the contract, no more were accomplished until late 1969, due to an unwritten policy against subjective incentives.*

in government contracting. Secretary of Defense Robert S. McNamara, who served under Presidents Kennedy and Johnson, had a tremendous effect on defense procurement. McNamara, a graduate of Harvard's Graduate School of Business Administration and a statistician for the Army Air Corps in World War II, was determined to upgrade procurement practices with modern management techniques. He put a halt to cost-based contracts, believing they encouraged waste by not linking profits to how well the job was done. During McNamara's term as Secretary of Defense, the percentage of military procurement dollars awarded by cost-plus-fixed-fee contracts fell from 39 percent in 1960 to 14 percent in 1964. Conversely, fixed-price contracts and fixed-price incentive dollars awarded rose from 45 to 55 percent in the same period.<sup>6</sup>

Although NASA is largely credited with creating the award-fee contract common today, both NASA and the Navy issued contracts with award-fee provisions in 1962. The Navy issued a contract for logistics operations support at Kwajalein Island that year, which included provisions for award fees. NASA issued a contract in October 1962 that provided for the research and development of a nuclear-powered rocket engine. A second NASA contract, issued in January 1963, covered the operation, maintenance, and engineering services for the Mercury Manned Space Flight Network.<sup>7</sup> NASA went from one incentive contract in 1962 to 34 by 1964 and by the beginning of 1967 was managing some 200 contracts with incentives.<sup>8</sup>

The Air Force was reluctant to jump into the award-fee game and did not issue its first contract until 1964. After the Electronic Systems Division issued the contract, no more were accomplished until late 1969, due to an unwritten policy against subjective incentives.<sup>9</sup>

Throughout the 1960s, NASA and the Navy used award-fee contracts extensively while the Air Force and Army shunned them. However, the Air Force expanded their use in the 1970s, as then Secretary of the Air Force Robert C. Seamans, Jr, mandated their use on major programs like the B-1 and F-15.<sup>10</sup>

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## Growth of Use

Throughout the 1980s and 1990s, the use of award-fee contracts increased *exponentially* throughout the DoD and Air Force. Historically reserved for large program contracts, award-fee contracts expanded into the smaller dollar arenas, and their use grew widely among installation-level service and maintenance contracts. In fact, one of the largest users of award-fee contracts on a consistent basis is the Air Education and Training Command (AETC). This command contracts out to private industry almost all the aircraft maintenance and many base support services conducted at its bases. With the rapid increase in use of award-fee contracts for base-level activities, the Air Force tasked the Air Force Logistics Management Center (now the Air Force Logistics Management Agency [AFLMA]) to author a guide on award-fee contracts, which was published in 1988.<sup>11</sup> The promulgation of this contract type among base-level offices and program offices caused AFLMA and Air Force audit agencies to do repeated reviews of implementation throughout the last 10 years. It is clear that award-fee use has grown substantially among Air Force contracting agencies.

## The Next Step in Evolution— Award Term

*The award-term incentive is a genuine innovation and one with great potential to forever alter the landscape of Government service contracting.*

—Vernon J. Edwards

The award-term contract is the newest incentive in government contracting. It was first used in 1997 but is not yet covered in the *Federal Acquisition Regulation* (FAR). Modeled after the award-fee incentive, it rewards the contractor by extending the contract term without competition. Under an award-term incentive, a government team monitors and evaluates the contractor's performance and reports their findings to a government term-determining official (TDO), who decides whether the contractor's performance is good enough to merit an extension. The award-term incentive was the inspiration

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*Under an award-term incentive, a government team monitors and evaluates the contractor's performance and reports their findings to a government term-determining official, who decides whether the contractor's performance is good enough to merit an extension.*

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## Analysis of Air Force Contract Implementation

*Although no one can speak with certainty regarding the future, it appears the use of award-fee and award-term contracts will continue to increase.*

of Tommy Jordan, a senior Air Force civilian employee at Kelly AFB, and was first used on a contract that the Air Force Aeronautical Systems Center awarded to the McDonnell Douglas Corporation in October 1997 for F-15C aircraft simulation services. The contract has a 7-year base period, which can extend to 15 years with excellent service.<sup>12</sup> Since that first use, at least 25 programs have included award-term incentives, including the \$10.2B public/private competition at Kelly AFB for aircraft engine maintenance.

In the last 3 years, agencies have used award-term incentives to acquire a variety of services, including technical and logistics support, laundry and drycleaning, depot-level maintenance, aircraft maintenance, grounds maintenance, janitorial services, real property maintenance and repair, and training.<sup>13</sup> The incentive is being used with several contractual configurations such as fixed price, cost reimbursement, indefinite delivery/quantity, and requirements. The Air Force, NASA, Naval Facilities Engineering Command, Naval Sea Systems Command, Fort Drum in New York, and the General Services Administration have all conducted or plan to conduct acquisitions with award-term incentives.

## Future Application

As of March 1990, the Air Force had identified 114 active, installation-level, award-fee contracts with a total contract value of about \$2.6B (including multiyear options) and potential award fees totaling \$145M.<sup>14</sup> Between fiscal years 1993 and 1998, the Air Force awarded commercial activity contracts totaling \$5.8B, with award-fee pools totaling \$230M.<sup>15</sup>

Although no one can speak with certainty regarding the future, it appears the use of award-fee and award-term contracts will continue to increase. The most likely category of acquisition for these incentives to grow in is competitive sourcing contracts and public/private competitions. There are two reasons for this. First, these types of contracts lend themselves to qualitative review since they are service oriented and not well suited to objective (versus subjective) evaluation criteria. Quality is inherently a subjective determination in performance of

services. Award-fee and award-term incentives best suit these kinds of situations. Second, these competitive sourcing or public/private competitions are excruciatingly painful for the acquisition community. They take enormous time and effort to complete (frequently 1 to 2 years). Therefore, award-term contracts should flourish because the benefits are great if they extend the time between competitions. If the contractor is performing well, the agency can use its manpower more efficiently on other acquisitions rather than relet the contracts because the minimum time is up. This more closely mirrors the private sector where long-term relationships with satisfactory performers are preferred. It is also quite likely that DoD competitive sourcing and public/private competition efforts will continue to grow or at least remain status quo as agencies search for the most efficient way to use available resources. These efforts will continue to be pursued where efficiencies and cost savings can be gained without impacting mission effectiveness.

Finally, it is the objective of DoD acquisition agencies to use incentives as much as possible. In 1997, the government iterated a policy encouraging agencies to use incentives “to the maximum extent practicable when contracting for services.”<sup>16</sup>

## Official Reviews and Findings

### Audit Reports

Despite the encouragement of senior acquisition officials throughout government to make use of incentives, particularly award fees, the challenge lies in using them correctly. Numerous studies and audits have been accomplished by Air Force agencies to review how well the acquisition community has done in implementing the award-fee concept. Occasionally, the decision to use award fees is questioned, but in most cases, the manner in which the contracts were implemented is the focus of the review.

### Titan IV Audit

In 1995, the Air Force Audit Agency (AFAA) conducted an audit of the Titan IV production contract incentive and award-fee program to determine if program office

*Despite the encouragement of senior acquisition officials throughout government to make use of incentives, particularly award fees, the challenge lies in using them correctly.*



personnel effectively structured and administered the multiple incentive contracts to motivate the contractor to achieve all program objectives. Though the audit covered numerous areas, this article highlights just the award-fee portion.

The general conclusion was that Titan IV program office personnel did not effectively structure the incentive and award-fee program or develop adequate procedures for evaluating and administering contractor incentive payments. Specifically, with respect to award fees, personnel did not adequately evaluate contractor performance based on the award-fee plan criteria. As a result, contractor performance ratings were not supported, and fees awarded were not commensurate with actual performance.<sup>17</sup>

The Titan IV production contract included an \$85M award-fee provision (pool) to motivate the contractor to achieve increased management, schedule, technical, and launch performance. The audit team determined that the contractor's performance was not adequately evaluated in accordance with the award-fee plan. Therefore, performance ratings recommended to the Award Fee Review Board (ARB) were not supported, and ARB award-fee percentages recommended to the fee determining official (FDO) were not commensurate with actual contractor performance. The following are summaries of specific findings:

- Evaluation monitor performance ratings did not provide comments with respect to key evaluation criteria or include specific examples that indicated the criteria were not satisfied. Further, monitor comments were too general to demonstrate whether the contractor complied with the criteria.
- Between January 1990 and January 1995, the prime contractor experienced significant cost increases due primarily to subcontractor cost overruns in the solid-rocket motor effort and schedule delay of 5 years and 2 years in the motor upgrade and other programs. However, the ARB-recommended management effectiveness and schedule performance ratings during this time period did not appear to consider contractor

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schedule performance in these areas. Moreover, the ARB recommended ratings for management and schedule performance that were higher than previous reviews. The audit team believed these should have been rated marginal at best, and the contractor should have received less award fee.<sup>18</sup>

These problems occurred because award-fee evaluation monitors were not adequately trained in evaluation and documentation requirements, evaluation criteria were ambiguous and difficult to apply, and the ARB used the award-fee process to place more emphasis on technical performance than permitted under the award-fee plan.

Experts from the Air Force Acquisitions Office concurred with the comments and instituted efforts to correct deficiencies noted by the audit. To prevent future questionable fee awards, the program office implemented new training and documentation requirements.

### **Management of Award-Fee Provisions in Installation-Level Supply and Services Contracts**

In February 1991, the AFAA released Project 0046411, which evaluated award-fee contracts at installations throughout the Air Force. The overall objective of the audit was to determine whether the Air Force effectively used and administered award-fee provisions in installation-level supply and services contracts. Specifically, the agency determined whether use of the award-fee provisions was adequately justified, the contract provisions included appropriate award-fee criteria, the evaluation and payment process was effective, and award-fee funds were effectively managed. The team found that Air Force management of installation-level, award-fee contracts required significant improvements. Specifically the report found:

- Contracting officers (CO) included award-fee provisions in contracts without determining that anticipated award-fee benefits would exceed the cost of the fees and associated effort to administer the special contract provisions. As a result, the Air Force

### **Analysis of Air Force Contract Implementation**

*The team found that Air Force management of installation-level, award-fee contracts required significant improvements.*

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## Analysis of Air Force Contract Implementation

incurred at least \$1.7M over the contractual life of the 17 contracts without determining and documenting whether commensurate monetary and nonmonetary benefits would result. The audit team determined the costs far outweighed the benefits in many cases. At Maxwell AFB, a \$4.6M contract included a \$40K per year award-fee pool as an incentive. The calculated administrative costs to administer the contract amounted to \$152K annually, far above the \$40K in possible incentives.

- Contracting personnel did not apply an appropriate methodology to establish the award-fee pool for 13 of the 17 contracts. In most cases, no formula or standards were used to establish the award-fee amount. As a result, 4 of the 13 contracts examined included about \$830K in potential excess profits.
- At least one award-fee contract provision was missing from 15 of the 17 contracts reviewed. Without these contract provisions, COs were not adequately protecting the government's interests, and contractors were not certain what was required to earn the award fees. The Air Force paid award fees when contractor performance did not warrant the fees and was more susceptible to litigation because its legal rights were not contractually established.
- For 13 of the 17 contracts reviewed, COs did not monitor the process for selecting performance evaluation team members to ensure only appropriate personnel were selected. In four instances, performance monitors had potential conflicts of interest, including actually working part time for the contractor they were evaluating. In 12 instances, people working for the organizations being served were excluded from the team.
- The process for evaluating contractor performance was not effective for 15 of 17 contracts. The Air Force paid award fees for 11 contracts without adequate evidence the contractor earned the fees. This included \$94K paid for 6 of the 11 contracts even though the contractor did not meet minimum acceptable performance requirements. At four locations, contractors were paid award fees for performing voluntary work that was not

contractually required or included in the award-fee criteria. At one location, fees were paid when a janitorial contractor worked on days not required and performed services in buildings not covered in the contract. The fee-determining official did not adequately justify the award fee paid and used criteria that were deemed unacceptable.

- Installation officials did not provide timely award-fee payments to contractors, requiring an average of 60 days after the end of the evaluation period to issue payment. This delay in providing award-fee payment was a potential demotivator for contractors.
- Accounting and finance personnel did not properly record award-fee funds as a contingent liability in accounting records for 15 of the 17 contracts. These officials prematurely recorded more than \$2.9M as obligations before the government had any legal liability to pay the contractor.

### **Analysis of Operational-Level, Fixed-Price, Award-Fee Contracts**

In January 1992, AFLMA began a project to help acquisition offices overcome findings in the 1991 AFAA audit report. The Agency was chosen because it published a base-level, award-fee guide in 1988 to assist offices in implementing the *new tool* known as award-fee contracts.

AFLMA reviewed the audit report and performed an independent analysis of the entire award-fee process from contract solicitation through administration of award-fee provisions. AFLMA also conducted interviews with using agency officials and contracting professionals to develop a professional consensus.

They concluded that many of the award-fee processes were broken and, in order to fix the system, a fundamental change in how base officials view award-fee decision making is necessary.

Contractors should have to earn award-fee money through above-and-beyond performance during each evaluation period instead of base officials looking for reasons not to pay the contractor the entire award fee amount.<sup>19</sup>

This finding indicates that AFLMA determined FDOs were committing a common error by starting the

contractor's fee entitlement at 100 percent and making reductions based on performance rather than starting at zero and working up (as the FAR requires). The agency also concluded that bases needed structured guidance to standardize award-fee procedures and that, under current processes, it is likely government is improperly spending money through unwarranted and unjustified award-fee decisions.

### **Award-Fee Management of Commercial Activity Contracts**

In March 2000, AFAA released an audit on award-fee contracts that highlighted continuing problems and a few new ones. Interestingly, the audit team was apparently unaware of the similar audit 10 years before, as they did not reference it in the prior audits section or in the body of the report. Therefore, the findings were certainly independent and show no bias toward confirming earlier findings.

The audit was conducted because of the increased use and associated cost of award-fee contracts, with the overall objective to determine whether Air Force personnel adequately managed award fees for commercial activity contracts. Specifically, the agency determined whether award-fee officials established award-fee provisions consistent with overall contract strategy, supported fees awarded, and managed award-fee funds.

The team concluded that award-fee officials could improve award-fee management for commercial activity contracts. Although officials established provisions consistent with the overall contract strategy, five of ten locations did not maintain adequate documentation supporting award-fee determinations.<sup>20</sup>

Specifically, performance monitors did not maintain adequate records supporting award-fee recommendations, award-fee review board members did not always document the results of award discussions, and FDOs did not adequately document the rationale for award-fee amounts that varied from review board recommendations. In at least two cases, the FDO significantly increased the fee amounts without rationale. Supporting documentation is important to help ensure the government pays

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appropriate award fees and is also critical if the contractor disputes the award-fee determination.

Award-fee officials at six of ten locations did not accurately account for award-fee funds. Specifically, they did not commit funds to establish contingent liabilities for award-fee amounts. Instead, they recorded the entire award-fee amounts as obligations or actual liabilities when evaluation periods began. As a result, for fiscal years 1996 through 1998, award-fee officials overstated funding obligations by \$1.9M.

The auditors recommended that the Air Force establish award-fee guidance incorporating best practices and procedures and rescind inaccurate award-fee obligation guidance. They also recommended the issuance of a policy letter instructing award-fee officials to commit funds as contingent liabilities when evaluation periods begin. The Air Force Acquisitions office concurred with the findings and tasked AFLMA to develop an Air Force guide. It also issued a finance policy with coordination on obligation of award-fee funds.

## Analysis of Air Force Contract Implementation

*In every instance, the reviewers found that performance monitors were not documenting or justifying their recommended award-fee amounts to the FDO.*

### Problems Resolved?

Analysis of these four audits indicates recurring problems with award-fee contracts. In every instance, the reviewers found that performance monitors were not documenting or justifying their recommended award-fee amounts to the FDO. Therefore, there was no legitimate rationale for paying the award fees. While the fees may be justified, lack of explicit rationale leads inquiring investigators to conclude fees are being paid for no good reason. Similarly, in three of the four audits, the FDOs were not explaining their rationale for granting the fees. In some cases, they even overruled recommendations from the monitors and board members. Again, lack of documented rationale could lead one to conclude contractors did not earn the fee but were granted it anyway. This conclusion is further supported by the AFLMA study, which indicated that FDOs commonly begin deliberations at an inflated fee amount (100 percent) and deduct for shortfalls. While the FDOs may have good rationale for the fees provided, the rationale is usually not clear.

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## Analysis of Air Force Contract Implementation

*The purpose of an award-fee incentive is to obtain better performance from the contractor than could logically be expected from a contractual arrangements.*

Additionally, all three audits reported some sort of discrepancy in financial calculations with respect to the fee pool amount. Both the 1991 and 2000 audits, specifically highlighted that funds should be tracked as contingent liabilities, not up-front obligations. At the time of this article, it is clear the Air Force has adopted such a policy.

## Award Fee in Application

### Concept

The purpose of an award-fee incentive is to obtain better performance from the contractor than could logically be expected from a contractual arrangements. It provides a means of applying incentives in contracts where performance objectives cannot be expressed in advance by definite milestones, targets, or goals susceptible to actual measurement of performance.<sup>21</sup>

For contracts with an award-fee incentive, the buying office establishes an award-fee plan that defines formal evaluation periods throughout the life of the contract. For each evaluation period, *fee pools*, which may be earned in part or whole by the contractor, are identified, as are the criteria, techniques, and data that will be used in the evaluation of the contractor's performance. During an evaluation period, technical and business monitors collect data and provide them to an award review board for further evaluation. Additionally, the contractor is invited and encouraged to submit self-assessments of performance for consideration by the review board during the formal evaluation process that occurs at the end of each evaluation period. The evaluation results and recommendations are documented by the board and given to the FDO.

Based on all inputs and personal judgment, the FDO determines the portion of the available fee to be awarded. The FDO then advises the contractor, in writing, of the fee decision and performance evaluation within 30 days of the end of the evaluation period. The fee decision and performance evaluation are subjective, unilateral, and until recently, not subject to the disputes clause of the contract.<sup>22</sup>

From the process just described, it can be seen that the nature of the award-fee concept allows the government to provide formalized periodic feedback to the contractor. It also provides the government with an opportunity to make periodic, thorough evaluations of progress and cause corrective action in areas under evaluation if performance is not as expected. The subjective after-the-fact nature of the performance evaluation and fee-determination process provides unique flexibility for its users.

## Regulations

Early coverage of the award-fee type contract was included in the Armed Services Procurement Regulation in the 1960s at the behest of senior government officials such as McNamara. In 1962, DoD promulgated new policies for the use of incentive contracts in the ASPR and published its first incentive contracting guide.<sup>23</sup> In 1969, DoD and NASA jointly published a second edition, the *DoD/NASA Incentive Contracting Guide*, and NASA has published several editions of award-fee guides since then. The Air Force published an award-fee guide in 1988 through AFLMA, and in 1997, the Air Force Materiel Command (AFMC) published its own version of the award-fee guide for use throughout its own command.

There is general guidance in the FAR but little prescriptive guidance. FAR Subpart 16.4, *Incentive Contracts*, states the government's policy about contractual incentives, describes five standard contractual incentives, and provides guidance for their use. It describes two classes of incentives: predetermined, formula-type and award-fee. However, most of the actual guidance has been published in unofficial guides or handbooks.

Although common in the Air Force for years, the award-fee incentives were not included in the FAR until publication of Federal Acquisition Circular 90-46 in May 1997. FAR 16.404 (a) explains the fixed-price, award-fee (FPAF) incentive as follows:

Award-fee provisions may be used in fixed-price contracts when the government wishes to motivate a contractor and other incentives cannot be used because contractor performance cannot be measured objectively.

*The subjective after-the-fact nature of the performance evaluation and fee-determination process provides unique flexibility for its users.*



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## Analysis of Air Force Contract Implementation

*Most respondents agreed award fees really do give incentive to performance, to some extent. However, the consensus was the mere granting of a bonus does not in and of itself increase performance significantly.*

FAR 16.404 (a) requires that, in FPAF incentive contracts, the parties negotiate a fixed price that includes profit. The government will pay the fixed price if the contractor performs satisfactorily. The parties must also negotiate an award (bonus) and an award-fee plan. FAR does not, however, prescribe the contents of the award-fee plan.

Although the FAR contains many passages about incentives in general, there is little award-fee guidance and no award-term guidance in the regulations. The organizational structure and procedures associated with these incentives, fee-determining official, award-fee board, and award-fee plan are not prescribed in the Federal regulation. Therefore, acquisition offices must turn to agency-specific guidance such as the award-fee guides published by NASA, AFMC, and AFLMA.

### **Fee Determination in Practice**

To determine exactly how award-fee contracts are being implemented and used in the Air Force, a telephone survey was conducted with government COs and FDOs, as well as representatives from industry, to collect their perspectives on award-fee contracts and their impact. Eleven COs with award-fee experience in AETC and AFMC were interviewed. These two commands represent the bulk of experience in Air Force award-fee contracts. AETC uses them for contracted base support and/or aircraft maintenance at virtually all their bases, and AFMC supervises most of the major systems acquisition efforts in the Air Force. FDOs from four bases were interviewed. These officials were usually the senior officer on the base or in the wing and held at least the rank of colonel. Eight members of industry who frequently bid on and currently hold award-fee contracts were also interviewed. These individuals were either in charge of or closely aligned with the proposal writing teams and very involved in actual performance of the contracts for which they competed. They also represented some of the largest companies in the defense industry, as well as some moderate-sized companies competing for government contracts.

To collect completely open, honest, and useful data, all participants were interviewed under the guarantee of

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nonattribution to themselves and their organization. This guarantee was necessary to ensure the most candid and descriptive answers possible. The analysis that follows represents the consensus of the consolidated answers.

## Analysis of Air Force Contract Implementation

### Industry Strategy Perspective

The industry respondents indicated that, on average in the last 3 years, they had bid on five separate programs that contained award fees. Additionally, the average number of award-fee contracts being performed by the respondents was three. These averages indicate credibility, showing they have extensive experience in both bidding and performing contracts with award-fee provisions. The average earned award-fee percentage for the companies varied by agency and command. One respondent clearly indicated that NASA typically gave higher fees on average but the Air Force was not far behind. The average for the Air Force was between 88 and 90 percent. The respondents did note that they track this data pretty carefully and know what the historical average is for each organization, major command, or agency. That information is used extensively in the proposal process.

*If the award fee is not shared among the employees, the incentive is only marginally effective, if at all.*

Most respondents agreed award fees really do give incentive to performance, to some extent. However, the consensus was the mere granting of a bonus does not in and of itself increase performance significantly. Notable improvement is usually not seen unless the award fee is somehow shared with the employees. In other words, in those companies that share award-fee sums (or some other inducement) with employees for increased performance, a marked improvement is seen. If the award fee is not shared among the employees, the incentive is only marginally effective, if at all.

The consensus was that award fees do not constrain contractors but they shift resources. The proposals are manpower intensive for both bidders and the award-fee boards. Typically, the companies expend significant effort making their case to the board that they deserve the fee. This *show* adds cost in both manpower and money to the contractor's bottom line. This, in effect, increases the cost of performance (which they account for in the original

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## Analysis of Air Force Contract Implementation

*When asked if award fees cause a contractor to alter proposal strategy, every respondent unequivocally answered yes.*

proposal) and takes manpower away from performing the actual work.

When asked if award fees cause a contractor to alter proposal strategy, every respondent unequivocally answered yes. It is inherent in proposal writing to account for the fee at least partially in structuring the proposal. When asked the followup question, "Do you plan on 100 percent of the fee," all answered no. However, they all said they count on a portion of the fee based on their assumptions, detailed analysis, and calculations from historical records. Rarely did history show they could count on 100 percent of the fee. However, all respondents confirmed that this lowered their profit margins in the initial proposal and increased their risk somewhat in the early stages of the contract. However, most believed the risk was no greater than moderate because they had never been denied a substantial portion of the fee. All agreed that if the FDO granted them little or no fee they would then be in a high-risk position but, again, stated that this almost never happens.

And finally, when asked if they found themselves performing work under award-fee contracts that they would not normally perform if the contract were structured differently, a majority of the respondents answered yes. The consensus was that they were more likely to do extra things to keep the board members and FDO happy. This could include tasks that, if performed under a fixed-price contract, would result in a claim.

### **Government Perspective**

Government COs are currently working on an average of two contracts with award fees (responses varied from one to five). None of the respondents indicated this was their first award-fee contract. Therefore, like industry representatives, the COs were seemingly well experienced in award-fee execution and administration. Therefore, the FDOs were not. Two of the four FDOs were on their first award-fee contract, and none were serving as an FDO on more than two. Despite little experience, all felt comfortable in the role and competent to perform as an FDO.

COs and FDOs agreed the average percentage of fee earned by their contractors was 85 to 90 percent.

COS and FDOs agreed that award-fee provisions in contracts improve contractor performance. The consensus was that award-fee incentives create a partnership-like environment and inspire innovation in contractors, which leads to more efficiency. Additionally, they believed employees genuinely work harder to gain the incentive. As a corollary to this question, the respondents believed the great improvement in performance was worth the extra effort and administrative burden on the government's part.

All respondents were asked if they knew or believed that the contractor's profit in the original proposal is considered when determining award-fee amounts. The two groups differed. FDOs indicated it was not a factor in their decision and, in most cases, they are unaware of the profit on the original proposal. The COs, however, had a perception that it was, in fact, a consideration, with the board and the FDO. The consensus among COs was that, even if it was not directly addressed, the FDOs were certainly aware of the original profit margin proposed either by direct personal evaluation or by fee lobbying by the contractors. They believe FDOs want to ensure contractors remain *healthy* and perform.

Both groups of government officials were asked if, during fee determination, the board and FDO tend to start from 0 percent and work up or start from 100 percent and work down. The typical CO response to this question was, "Are you asking what we should do or what we actually do?" That response summarizes the common view among the contracting community in general and certainly among the respondents that fees are usually worked from 100 percent down. COs believe the FDO starts out wanting to give the maximum fee and then finds reasons to deduct for things not done well instead of justifying why the contractor should get any increment of the fee at all. Interestingly enough, the FDO responses did not fully support this but did not refute it either. The FDO consensus was that they usually start from the board recommendation and work from there. However, one FDO did indicate a bias toward higher amounts by focusing on the negative performance indicators rather

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## Analysis of Air Force Contract Implementation

*The findings clearly show that award-fee contracts are not implemented as intended, since the same problems are being experienced now as 10 years ago. These problems, however, are procedural in nature and can be fixed easily.*

than the positive ones. Given that this FDO's award amounts fell into the same range as the others, it can be reasoned that this FDO sets an amount and subtracts for performance rather than trying to justifying any fee at all.

All COs believed the contractor's risk of lower profit margins was increased with award fees due to contractors shaving initial profits in proposals. COs believe contractors have begun to count on the award fees as part of their total profit and, therefore, are bidding tremendously low profit margins to stay competitive and win the business. They believed (like the contractors) this translates into a moderate risk for the contractors. However, none of the COs could provide data showing the increased risk is detrimental. None of their award-fee contracts had failed, indicating the increased risk did not result in any casualties.

## Conclusion and Recommendations

Review of the data collected during this research has illuminated numerous problems with award-fee contracts. The conclusions associated with research are mixed, however, when compared with the research question. Indeed, it appears there are genuine disconnects in the implementation and administration of award-fee contracts, and those disconnects prevent the contracts from working as originally intended. However, the deleterious effects of the broken process are not as grave as one might imagine. The question of whether changes are necessary to improve the effectiveness of this contract tool is the difficult one. The research clearly indicates changes are necessary. However, in most cases, it appears changes would improve efficiency but not necessarily effectiveness.

## Principal Conclusions

The findings clearly show that award-fee contracts are not implemented as intended, since the same problems are being experienced now as 10 years ago. These problems, however, are procedural in nature and can be fixed easily.

Improvements are needed, but they will not impact effectiveness, only efficiency. As the audits and studies show, guidance is needed for the Air Force community on how to implement award-fee contracts properly. However, based on the nature of the findings, it appears the Air Force

has been directing its guidance to the wrong audience. The guidance is usually produced by the contracting community for the contracting community. However, the recurring problems identified with the performance monitors and FDOs; therefore, any guidance produced to help the process should be directed toward them.

Finally, it is clear from the data gathered from industry and government sources that we indeed are giving incentives to contractors to bid near zero profit and, therefore, increase their risk. However, the effects of that issue are not detrimental, as might be expected, for two reasons. First, the process to award this type of contract is usually complex and uses best-value approaches, enabling the government to consider lots of quality indicators. Therefore, the contractors typically selected are quite solid and less prone to failure in the first place. The increase in risk is mitigated by the quality of the company. Second, the award-fee process, by its nature, allows the contractor to gain additional funds throughout the contract, and the government evaluation team is likely to *help* a contractor in order to maintain consistency of service. This built-in dynamic also mitigates the risk to contractors by providing a mechanism to lessen the contractor's exposure to risk throughout the contract.

The research supported the contention that the Air Force is not implementing award-fee contracts as intended and is, in fact, giving incentive to the wrong behavior in industry. However, the result is not extraordinarily detrimental to Air Force goals because of the inherent ability of the award-fee board to overcome additional risk. It is clear that improvements are necessary, but the gains will be in efficiency, not in effectiveness.

## Recommendations

- The Air Force should develop and distribute a standardized format and template for performance monitors and FDOs to use when documenting their support of the fees awarded.
- Training initiatives should be redirected, and training and assistance for noncontracting personnel (performance monitors and FDOs) is needed. The next product (guide or training course) developed should

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target them specifically and cover topics outlined above.

- COs should seek feedback from industry before including fee or term incentives in future contracts. The value of incentives can be overestimated by government personnel, causing great administrative burden with little return.

### Notes

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4. James F. Nagle, *A History of Government Contracting*, Washington DC: George Washington University, 432.
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*When the Contingency is Over but  
Operations from the Location Aren't*

# Contingency Operations

For the last 10 years, supply support at Prince Sultan has been in the form of readiness spares packages and contingency high-priority mission support kits for reparable assets and high-priority mission support kits for consumable items.

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**Captain Andrew W. Hunt**

**W**hat does the phrase *short term* mean? In sports, it measures the tenure of a college football coach who has consecutive 3-8 seasons. In politics, it symbolizes the presidency of Gerald Ford or the vice presidency of Selma, Alabama's own Rufus King. When it comes to Air Force contingency support, the phrase takes on a whole new meaning. Short term, in the Air Force, can mean days, months, years, or even epochs.

So when does short term mean short term? In 1999, Lieutenant General Michael E. Zettler (Air Force Director of Installations and Logistics) posed a variation of that very question. While touring the Southwest Asian theater, General Zettler asked some very interesting questions concerning Air Force supply support (especially at Prince Sultan Air Base, Kingdom of Saudi Arabia). "Why, if we have been operating continuous operations from Saudi Arabia for more than 10 years, are we continuing to employ *short term* contingency support procedures? Does a decade of enforcing no-fly zones in support of Operation Southern Watch really constitute contingency operations?"



## Contingency Operations



*For the last 10 years, supply support at Prince Sultan has been in the form of readiness spares packages and contingency high-priority mission support kits for reparable assets and high-priority mission support kits for consumable items.*

In the wake of General Zettler's trip to Southwest Asia, the Air Staff tasked the Air Force Logistics Management Agency (AFLMA) to analyze the effects of using standard, peacetime supply-support procedures at long-term contingency locations (in this case, Prince Sultan). To determine which support procedures are better suited for these long-term contingency locations, we will start by breaking down procedures currently in place.

For the last 10 years, supply support at Prince Sultan has been in the form of readiness spares packages (RSP) and contingency high-priority mission support kits (CHPMSK) for reparable assets and high-priority mission support kits (HPMSK) for consumable items. RSPs are designed to support a predetermined number of aircraft, supporting a specific operations plan for 30 days without resupply. The RSPs are built so a specific number of aircraft are mission capable at the end of the 30-day support period. Well, in a perfect world, the RSP would always be sufficient and able to handle every need thrown its way. As most of us can attest, this is anything but a perfect world. There are times when the RSPs need a little help. This help comes in the form of a CHPMSK. As of November 2000, there were four approved CHPMSKs supporting the KC-135s, F-15s, F-16s, and C-130s at Prince Sultan. These kits, designed to supplement RSPs, include two kinds of items: those in the RSP but not in enough quantity and items not in the RSP that maintainers have decided they need. CHPMSK requirements are not additive to the worldwide requirement. The parts sourced to fill them come from existing peacetime operating stock. Some unit somewhere ships parts from its stocks when the Air Force fields a CHPMSK. HPMSKs serve as buffers for maintainer-brought bench stocks of consumable items. If a maintainer runs out of a particular bolt that is in the unit's bench stock, then, ideally, the HPMSK would contain a reserve of that item. So, what is the problem? For 10 years, the Air Force has employed this support concept, and no one has cried "foul." Why change? General Zettler's concern notwithstanding, there may be other reasons to change. In fact, the objective of this study was to determine the effects on supply support if the same procedures used at established bases were used at Prince

Sultan. If we treated Prince Sultan like an established air force base for supply support, would it be able to accomplish its mission requirements? And what effect would reverting to normal peacetime support have on the entire Air Force?

Mission accomplishment was not the only consideration; peripheral issues also had to be addressed. Strict regulations authorize the presence of only a certain number of American people in the Kingdom of Saudi Arabia at any time. If switching to standard supply support procedures necessitated an increase in manpower, that might be a problem. And we wanted to identify potential warehousing space increases, as they could be roadblocks as well.

### Reparables

Using the November 2000 Central Leveling Summary and the list of approved CHPMSKs for Prince Sultan, we determined more than 3,000 items were eligible for a level in the Air Force readiness-based leveling (RBL) system. For comparison purposes, we removed all the CHPMSK quantities and ran RBL to determine what would be pushed to Prince Sultan based strictly on demand (CHPMSK quantities are computed manually and are not always based on actual demand). Table 1 represents a breakdown of those 3,000-plus items.

What is eye-catching here is, of the 3,611 reparable items loaded at Prince Sultan, 74 percent (2,658/3,611) have no CHPMSK quantity *and* no RBL level. This means the items are not in the CHPMSK, and based on the demand for those items, RBL would not push levels to Prince Sultan. An additional 366 items had a CHPMSK

<b>CHPMSK or RBL&gt;0</b>	<b>953</b>
CHPMSK>RBL, RBL=0	366
CHPMSK>RBL, RBL=0, DDR>0	98
CHPMSK>RBL, RBL>0	119
CHPMSK=RBL, RBL>0	56
RBL>CHPMSK	412
<b>CHPMSK=RBL=0</b>	<b>2,658</b>
<b>Total</b>	<b>3,611</b>

Table 1. Items Pushed to Prince Sultan AB

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Contingency  
Operations

*How do we know  
what effect using  
standard  
procedures will  
have at Prince  
Sultan? Expected  
back orders  
(EBO) are a  
good indication  
of support.*

NSNs with Demand Level (SBSS demands)	51
<b>Demand Level=0, Daily Demand Rate&gt;0</b>	
DL=0, DDR>0, MRSP auth>0	157
DL=0, DDR>0, MRSP auth=0	596
Total	<b>753</b>
<b>Demand Level=0, Daily Demand Rate=0</b>	
DL=0, DDR=0, MRSP auth>0	1,176
DL=0, DDR=0, MRSP auth=0	3,339
Total	<b>5,615</b>
Grand Total	6,419

**Table 2. EBOs Resulting from RBL Runs**

quantity, but if it were up to RBL, Prince Sultan would not earn levels for those items.

The real items of concern are the 98 with usage (daily demand rate > 0). There is a CHPMSK quantity, but RBL does not see enough demand to warrant a level. Prince Sultan's contingency (high-priority) mission may drive a need to hang onto these items. Another subset of items worth looking at are the 119 where RBL *would* push a level based on demand but the level would not be as high as that loaded in the CHPMSK. For example, RBL might push a level of three for national stock number A. The CHPMSK quantity is five. Maybe we do not want to completely wipe out the extra two if we use standard supply support procedures. A third group is the 412 items where RBL would actually give *more* assets than are loaded in the CHPMSK. By not using RBL in this case, supply support is not optimized.

How do we know what effect using standard procedures will have at Prince Sultan? Expected back orders (EBO) are a good indication of support. Two separate RBL runs were conducted. The first included the CHPMSK quantities. The second removed the CHPMSK quantities and allocated assets based on demand. Table 2 shows the EBOs as a result of both runs. The second category of items in the table represents the 412 where actual demand would dictate a higher level than is in the CHPMSK. According to the data, if the CHPMSK quantities are used, the result is 115.6 EBOs at Prince Sultan and 633 EBOs worldwide. If RBL quantities are used, the resulting EBOs

for Prince Sultan and worldwide are 26.2 and 576, respectively. In this case, it is evident it would be beneficial for the Air Force to delete the CHPMSK details and allow the automated RBL system to allocate the necessary levels. Overall, the data show that using RBL instead of a CHPMSK would reduce EBOs at Prince Sultan by 75 and by 151 worldwide. Big deal—151 back orders do not appear to be that substantial, right? Using an AFLMA report that correlates a change in mission capability (MICAP) (in our case EBOs) to a change in aircraft mission-capable rates, we found that switching to standard peacetime supply procedures at Prince Sultan would increase worldwide aircraft availability by 2.34. Table 3 delineates the effect on the different aircraft currently supported by a CHPMSK at Prince Sultan. Imagine the effect on the Air Force if *all* long-term contingency locations started using standard peacetime supply support procedures!

Just because the data show a reduction in EBOs does not mean every CHPMSK detail should go away immediately. There may be some items for which past demand is not the best indicator of actual or projected usage. Those items may need to be retained on a CHPMSK detail. The recommendation is to *selectively* delete the CHPMSK when sufficient demand history is accumulated (1 year). The key is the word *selectively*. If the major commands see no reason to delete a CHPMSK detail and rely solely on an RBL level, they have the option (in the short run) to keep that CHPMSK detail.

*Just because the data show a reduction in EBOs does not mean every CHPMSK detail should go away immediately. There may be some items for which past demand is not the best indicator of actual or projected usage.*

MDS	% Increase in MC Rates (fleet-wide)	Increased Available Aircraft (Worldwide)
C-130	0.047410	.25
KC-135	0.230695	1.26
F-15	0.035000	.18
F-16	0.045786	.65
Totals		2.34

Table 3. Worldwide Effect of Switching to Standard Peacetime Procedures at Prince Sultan AB

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## Contingency Operations

*As with the reparable, we found a large quantity of consumable items on HPMSK details just not being used.*

## Consumables

Along with reparable, consumable assets are also affected by our proposal to use standard peacetime supply procedures at contingency locations. As with the reparable, we found a large quantity of consumable items on HPMSK details just not being used. As of November 2000, 6,419 consumable assets were loaded on HPMSK details at Prince Sultan. Table 2 shows a breakdown of the usage of these items—only 51 of the 6,419 items even had a demand level in the Standard Base Supply System (SBSS). This means the demand for these items necessitates a demand level under SBSS criteria (12 demands for that item within a 12-month period). Additionally, 5,615 items did not meet these criteria for a demand level or have a daily demand rate. In essence, these items were just sitting on the shelf. Why keep them? In fact, our studies show there would be no adverse impact on supply support at Prince Sultan if these items were turned in and the HPMSK details deleted.

We did find 753 items that did not meet the criteria for a demand level but showed some demand, as there was a positive daily demand rate (albeit in most cases, a small one). Of these items, 157 were authorized on RSP details, and that authorized quantity was sufficient to cover annual requirements at Prince Sultan. The other 596 were not on an RSP detail and may need some measure of retention. Options for this category include leaving them on the HPMSK detail or establishing bench-stock details at Prince Sultan and replenishing the stocks using normal SBSS procedures.

This brings us to an interesting discussion of current consumable practices at Prince Sultan. As it turns out, maintainers deploy to Prince Sultan with their own stash of bench-stock items, sometimes called mobile bench stocks (MBS). They pull from these stocks for day-to-day use. If they run out, they dip into the HPMSK. The problem is, the only demands recorded are the ones initiated by use of the HPMSK. This means the maintainers use the MBS but do not replenish them until they return home. Therefore, all demands associated with the use of consumable assets (not caused by pulling from

the HPMSK) are captured at home station and not where they are actually used. If the maintainers replenished their stocks through the Prince Sultan account, we would have an accurate picture of demands for consumable items. As it stands, only a small portion of the actual demand at Prince Sultan is ever recorded. Other issues, such as the use of a proper demand code, were factors and are currently being investigated by the Air Combat Command.

So what is the end story for consumables? First, get rid of the 5,000-plus HPMSK details for those items with no demand and no daily demand rate. For 596 items found in the RSPs as well, get rid of the HPMSK details, as the RSPs have adequate quantities to satisfy mission requirements. For the 157 not in an RSP, maybe we keep the HPMSK details in the short run. Maybe we establish a permanent bench stock at Prince Sultan. The end goal would be enough bench stock at Prince Sultan so maintainers would have to bring next to nothing with them. This happens when we have enough demand history to establish realistic levels. However, we realists know maintainers will always bring their own stuff. So be it. But there needs to be a way to capture the demand at Prince Sultan. There needs to be a way to make it easy to transfer the MBS to the deployed location and replenish there.

As with some reparables, the use of certain consumables may not be predicted easily or accurately using past demand. For those items, we can either keep any HPMSK detail or establish a special bench-stock level to ensure those specific items are on the shelf if needed.

## Using Everyday Procedures

The bottom line is, there is way too much stuff over there not getting used that might be better used somewhere else. We use inefficient and time-consuming manual procedures based on the nature of operations. Using everyday procedures would automate the distribution and allocation of parts and ultimately increase the support to warfighters. That should be our main concern.

To make this switch work, certain issues and policy challenges need to be addressed. Application of Joint Chiefs of Staff (JCS) project codes, asset protection, and order of use and fill are three such issues.

*Using everyday procedures would automate the distribution and allocation of parts and ultimately increase the support to warfighters.*



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## Contingency Operations

*When the CHPMSK goes away, there has to be a way to keep the important widgets at Prince Sultan and prevent them from being shipped to bases with lower priority needs. The way to make this happen at Prince Sultan is to put a global freeze on the entire account in the MICAP Asset Sourcing System.*

## Project Code Assignment

Right now, RSPs and CHPMSKs are replenished using approved JCS project codes that give their requisitions a higher priority and ensure the units at forward-deployed locations get the support they need. If we selectively eliminate the CHPMSK details and allow RBL to push levels that, in essence, become peacetime operating stock (POS), how do we make sure the right requisitions still get the project code since, normally, POS requisitions are not afforded the use of a project code. First, we have to identify the proper range of items eligible to receive the project code based on the specific contingency flag applied to that location. Items that used to reside in a CHPMSK and are now POS will be included in this range. After the range is identified, a system change will have to be made that assigns a requisition exception modifier identifying these now-POS items as eligible for a project code. While this may sound confusing, it really is not. We are only ensuring the right POS items continue to have the project code loaded against them, since the elimination of a CHPMSK cannot mean a loss of supply support.

## Asset Protection

Items currently in a JCS project-coded CHPMSK or RSP are not subject to redistribution to fill a lower priority. Simply put, this means a widget from a Prince Sultan CHPMSK will not be shipped to Maxwell AFB, Alabama, to fill a routine requisition. However, when the CHPMSK goes away, there has to be a way to keep the important widgets at Prince Sultan and prevent them from being shipped to bases with lower priority needs. The way to make this happen at Prince Sultan is to put a global freeze on the entire account in the MICAP Asset Sourcing System. This will protect all base assets from *automatic* lateral support. People at other bases can still use the system to view which assets are at Prince Sultan; it just will not let them reach in and take them automatically.

## Order of Use and Fill

Currently, assets are pulled from the RSP first and then the CHPMSK, if needed. The CHPMSK is filled first, followed by the RSP. If the CHPMSK is deleted and RBL levels take their place, things become a bit muddled. In

this case, the RBL level would be used first, then the RSP. The order of fill also reverses, with the RSP getting first dibs, then the RBL level. To ensure deploying units do not rob and pillage the shelves of contingency locations, a program needs to be developed that will *derobust* RSPs on their way home and fill the RBL levels. This means the 1234<sup>th</sup> Fighter Wing's RSP will be used to fill Prince Sultan shelves when the RSP is redeploying to home station. The redeploying unit can work on filling its RSP once it gets home.

## Summary

HPMSKs and CHPMSKs can be deleted selectively at Prince Sultan, and reverting to standard peacetime supply support procedures will have no adverse effect on supply support. Eliminating these details (more than 5,600 HPMSK and 2,600 CHPMSK details) requires no additional warehouse space or manpower. The overall reduction of range and depth of stock will not require any additional infrastructure at Prince Sultan. We have concluded this move to standard procedures is feasible, and some issues need to be worked to make it happen. Again, the bottom line is using *contingency* support at a base where we have been operating for nearly a decade does not make sense. Using the procedures we use every day (and are quite proficient at) should be the order of business. We can provide better support through better allocation of scarce resources, and we can do it all using systems that were designed to do just that.

*HPMSKs and CHPMSKs can be deleted selectively at Prince Sultan, and reverting to standard peacetime supply support procedures will have no adverse effect on supply support.*

## Future Opportunities

Why stop at Prince Sultan? There may be Air Force-wide benefits here. Could these standard peacetime procedures be applied to *all* long-term contingency locations, including the locations with both contingency-tasked and nontasked aircraft? For example, look at Ramstein AB, Germany, which has permanently assigned C-130s. Ramstein is also the beddown location for other C-130s supporting a variety of deployments. These temporarily assigned birds have been going to Ramstein for a while now, and they still use CHPMSKs and HPMSKs to augment their RSPs for support, while the base's own birds

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## Contingency Operations

use the peacetime stock sitting on the shelves. So the conundrum is, how do we standardize support for both tasked and nontasked aircraft at the same location while maintaining the proper level of support for the contingency-task units? I don't know. But the AFLMA Supply Division is working with the Standard Systems Group to figure out how to do this very thing.

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## Notable Quotes

*Logistic considerations belong not only in the highest echelons of military planning during the process of preparation for war and for specific wartime operations, but may well become the controlling element with relation to timing and successful operation.*

**Vice Adm Oscar C. Badger, USN**

*It is no great matter to change tactical plans in a hurry and to send troops off in new directions. But adjusting supply plans to the altered tactical scheme is far more difficult.*

**Gen Walter Bedell Smith, USA**

*Do what is right, not what you think the higher headquarters wants or what you think will make you look good.*

**Gen Norman Schwarzkopf, USA**

*Mobility is the true test of a supply system.*

**B. H. Liddell Hart**

*It may be of interest to future generals to realize that one makes plans to fit circumstances and does not try to create circumstances to fit plans. That way lies danger.*

**Gen George S. Patton, Jr, USA**

